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OCTOBER, 1906.

$2.00 per year.
$3.00 with Directory.

TEXTILE WORLD RECORD

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LORD & NAGLE COMPANY · Boston & Philadelphia

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TS1300
.T3C

The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

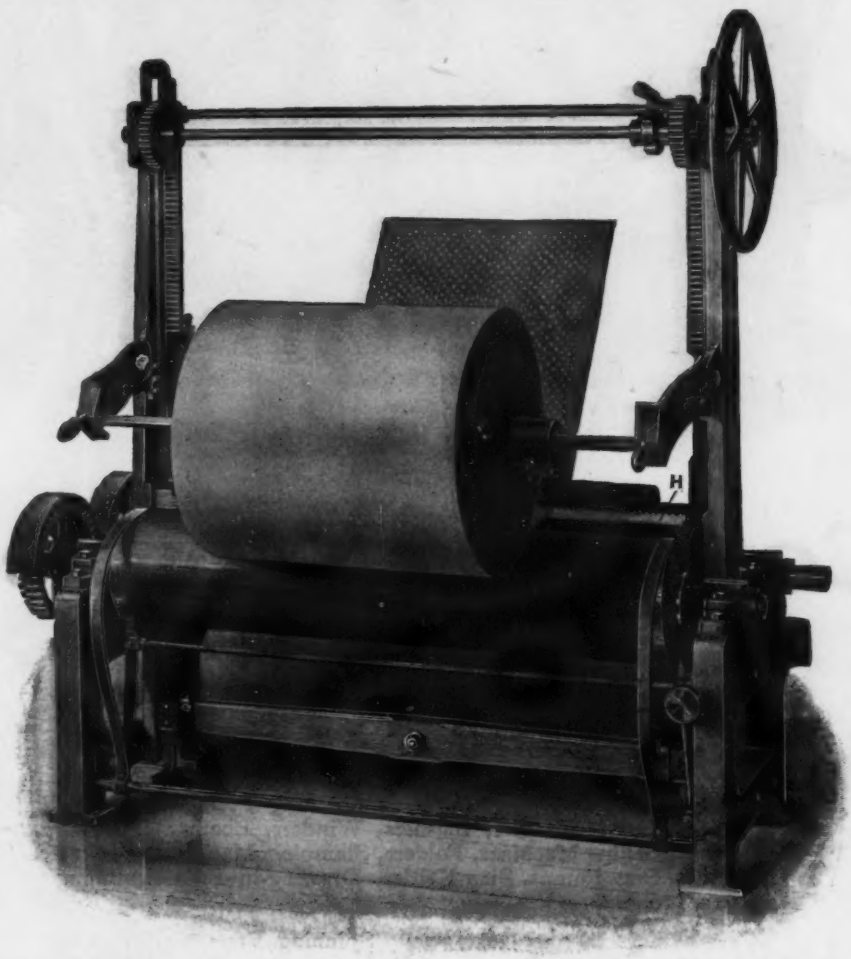
Estimates, Drawings and full particulars of complete plants furnished on application.

Southern Agent, STUART W. CRAMER, Trust Bldg., Charlotte, N. C., Equitable Bldg, Atlanta, Ga.

17

435
8421

Better winding at less cost



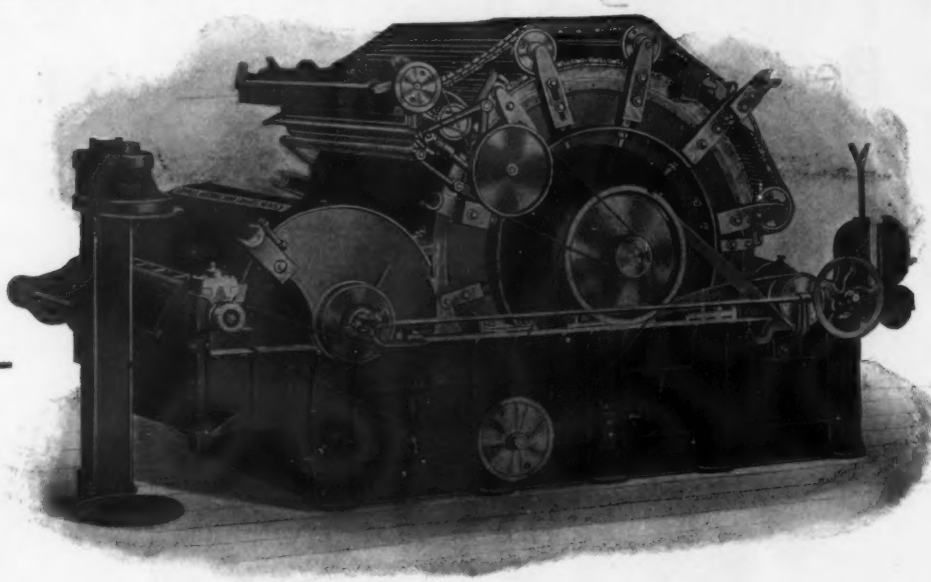
Simpson's Cloth-Winder Saves Shrinkage.

It begins the new roll smooth and keeps the cloth to its full width. Keeps the cloth clean—saves refinishing forty or fifty yards that are usually soiled by the ordinary methods. Cuts the cloth right to the seam—no waste there. Saves the time and health of your men. Send for descriptive circular, which shows how simple a machine it is.

Usually pays for itself the first year.

H. W. Butterworth & Sons Co., York and Cedar Sts., Philadelphia.

49



Cotton and Worsted Machinery

With Modifications to Suit Any Class of Work.

Cotton Machinery: Cards, Railway Heads, Drawing Frames, Fly Frames, Speeders, Ring Spinning Frames, Twisters, Spoolers, Reels, Warpers, Slashers, Winders, Looms, Shearing Machines, Balling Machines, Folders, Stamping Machines, Sewing Machines, Size Pumps, Size Kettles, Drawing-in Frames, Baling Presses, Indigo Grinders.

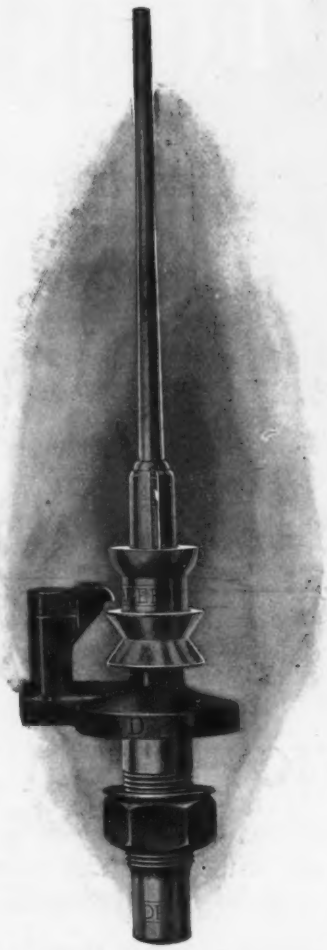
Worsted Machinery: Spinning Frames with caps, rings or flyers, Dandy Rovers and Reducers, Cone Second Finishers, Reducers and Rovers, Gill Boxes for Drawing, Preparing and Finishing, Weigh Boxes and Drawing Boxes, Cap Trap, Flyer and Ring Twisters.

Plans, Specifications and Estimates furnished upon application.

Lowell Machine Shop

LOWELL, MASS.

A New Spindle Improvement



The Rabbeth Centrifugal Bobbin Clutch.

Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

Allows easier and quicker doffing — stronger bobbins — less reaming.

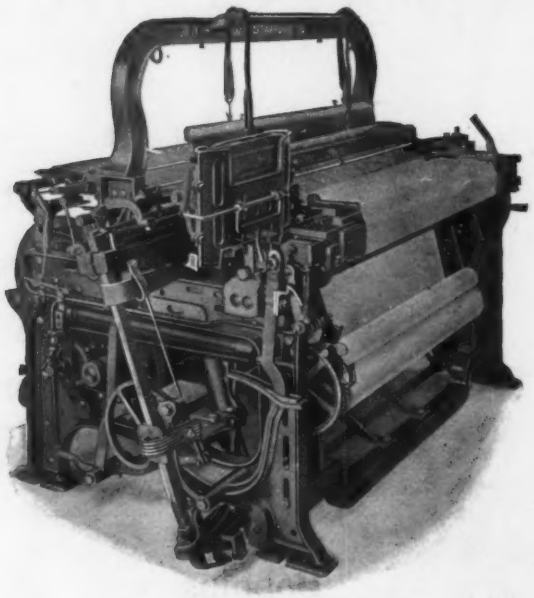
Draper Company, Hopedale, Mass.

We Also Build Looms.

THE GEO. W. STAFFORD COMPANY

WEAVING MACHINERY

READVILLE, MASS.



Ideal Automatic Loom

History Repeats Itself

Our previous successful efforts in the line of improvements in weaving machinery have culminated in our new

IDEAL AUTOMATIC LOOM

Considering quantity of goods produced per weaver, quality of goods, cost of supplies, repair bills, etc., there is no other loom can compare with it for economy of operation.

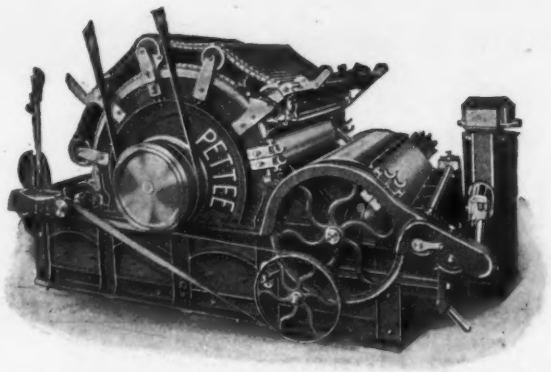
Cop or bobbin filling may be used equally well. One weaver can operate successfully from twelve to thirty looms, and under favorable conditions even more. No reduction in speed. A high grade plain loom as a basis.

Write for further particulars

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

COTTON MACHINERY



Pickers,
Revolving
Flat Cards,
Drawing
Frames,
Railway Heads,
Slubbing,
Intermediate
and
Roving
Frames,
Spinning Frames,
Spoolers
and
Reels.

Shops—

Biddeford, Me.

Newton Upper Falls, Mass.

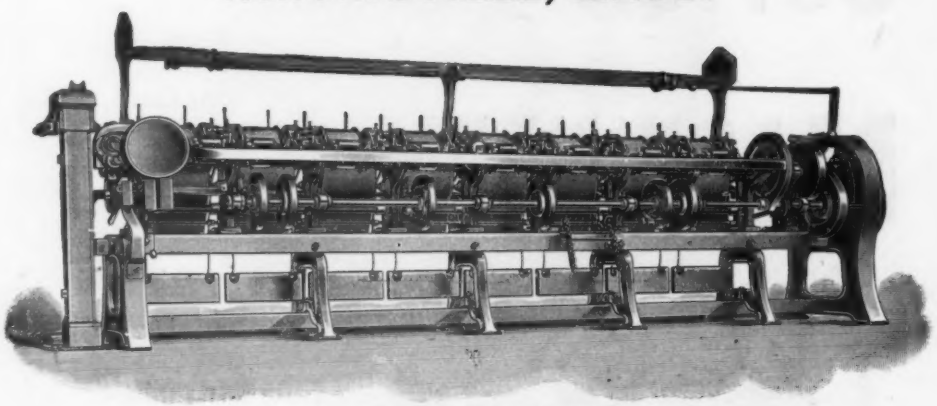
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



The Whitin 8 Head Comber.

Revolving Flat Carding Engines,
Combers,
Sliver Lap Machines, Ribbon Lap Machines,
Railway Heads,
Drawing Frames, Spinning Frames,
Spoolers, Twisters,
Long Chain Quilling Machines,
Reels, Looms.

Southern Agent,
S. W. CRAMER

Trust Building, CHARLOTTE, N. C.
Equitable Building, ATLANTA, GA.

"Kitson Products"

Blowing Systems

For Conveying Bale Cotton
from Storehouse to Picker-room

Self-Feeding Openers
Lappers and
Cleaning Trunks

Waste-Working Machinery

Raw Stock Cotton Dryers

We own the Patterns and can furnish REPAIR PARTS for PICKERS
formerly built by

WHITEHEAD & ATHERTON, . Lowell, Mass.
ATHERTON MACHINE CO., - - Lowell, Mass.
A. T. ATHERTON MACHINE CO., Pawtucket, R. I.

Kitson Machine Shop

Lowell, Mass.

SCOTT & WILLIAMS

2079 E. Cumberland Street, Philadelphia, Pa., U. S. A.

BUILDERS OF

Full Particulars, Samples and Special Catalogues on Application.

Rib Knitting Machinery for Underwear and Hosiery

Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

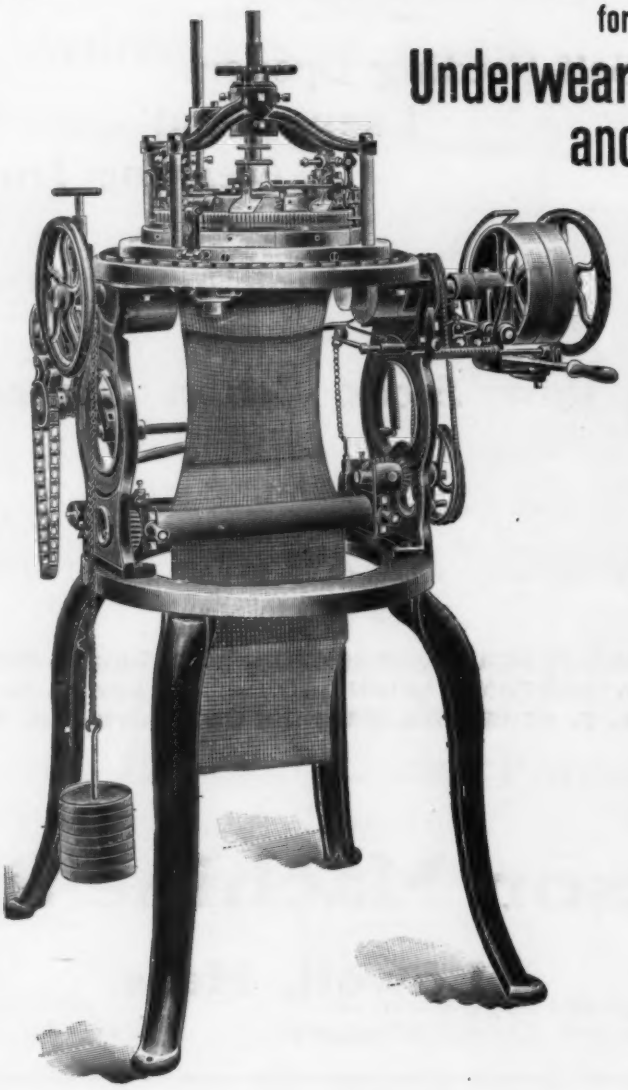
Improved Measuring Device, by actual length knit.

Sizes 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, 4 to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters, etc.



The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.

We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Automatic and 7-8 Automatic Seamless Hosiery Machinery.

For Knitting Machines Using Automatic Stop Motions

No catching on the surface with wool, worsted, mercerized cotton, silk, or backing yarns.

Wound by a Self Oiling Thoroughly Tested Machine.

High speed machines for all classes of winding made with interchangeable parts throughout.

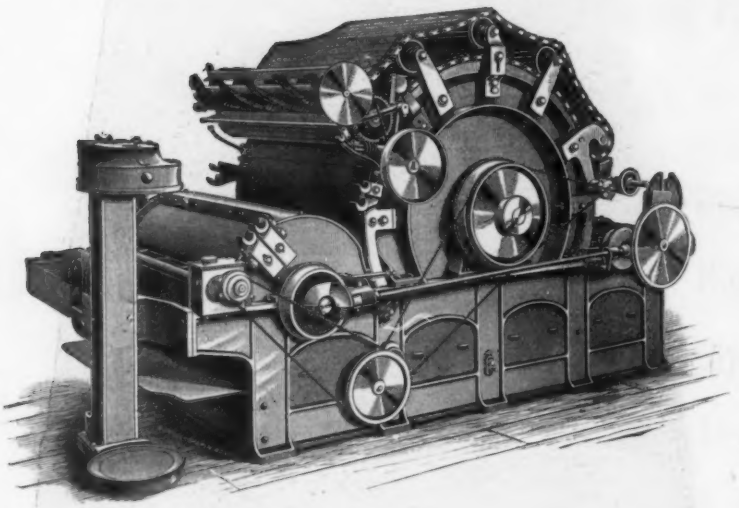
Universal Winding Co., Boston, Mass.

Cotton Machinery

MASON MACHINE WORKS,

TAUNTON, MASS.

Southern Office,
Charlotte,
N. C.



Cards,
Combers, Railway
Heads, Drawing Frames
Spinning Frames, Mules and Looms

INCLUDING

Plain and Fancy Silk Looms

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

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IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber will comb from 7-8" stock to Sea Islands.
Platt's Special Machinery for Making Cotton Waste into Yarns.
Platt's Special Machinery for Making French Worsted Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.
Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

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Dyeing and Finishing Machinery.
Archbutt-Deeley System for purifying and softening water.

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Flax, Hemp and Jute Machinery.

GEORGE HODGSON, LTD.

Looms for Worsteds, etc.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material.

JOSEPH SYKES BROS.,
Card Clothing for Cotton.

JAMES CRITCHLEY & SON'S,
Card Clothing for Woolen and Worsted.

DRONSFIELD BROS'.

Grinding Machinery and Emery Filleting. The Best French and English Combing and Rubbing Aprons. Harding's Pins and Circles. Varey's Fallers, etc.

Jacob K. Altemus is

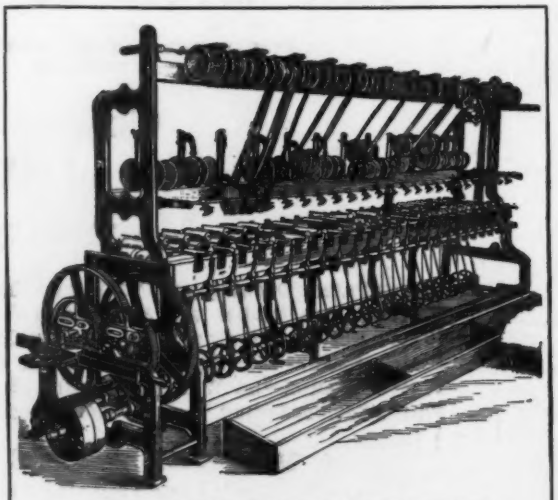
Able to supply the best

Cop Winding Machinery

Or Hosiery Winders and more in particular

Bobbin Winders,

Keep in mind that I



The Greatest Bobbin Winder for Skeins Ever Built.

Always produce machines that are right

Letting nothing go out

That is not satisfactory before delivery.

Every

Manufacturer should investigate warping and beaming machinery, warp splitting as well,

Upright Spoolers, Quillers, Warpers, Twisters, etc.

Send for full information and prices.

Textile Machinery

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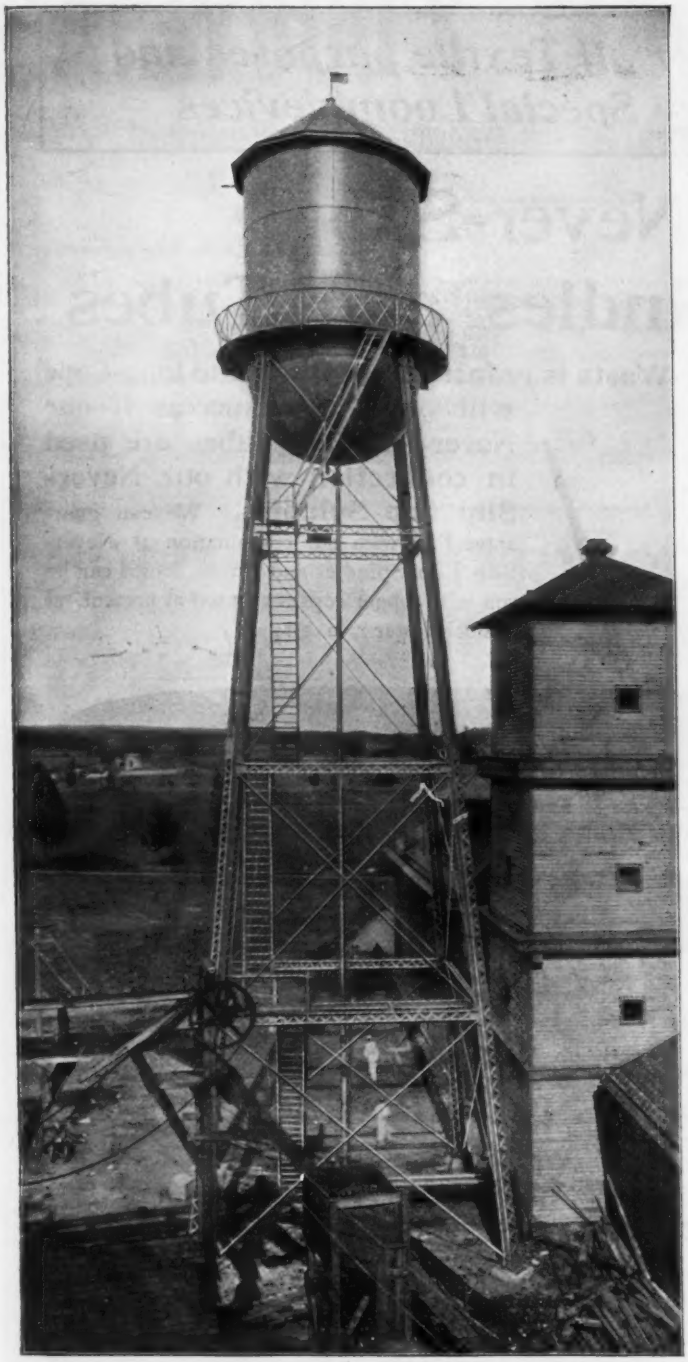

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Water Towers

Are furnished by

Tippett & Wood

They provide a storage for water under pressure, and are valuable for fire protection and personal uses

The T. & W. Towers do not fall or leak.

All Sizes Built

Plans and prices given on application.

Address

Tippett & Wood

Phillipsburg, N. J.

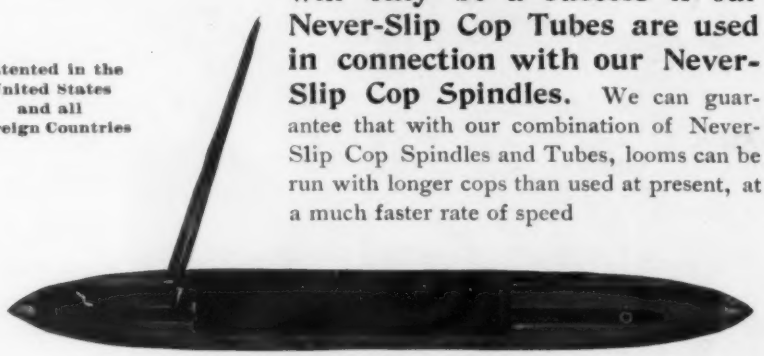
Shuttles for all Textile purposes and Sundry Special Loom devices

Never=Slip Cop Spindles and Tubes

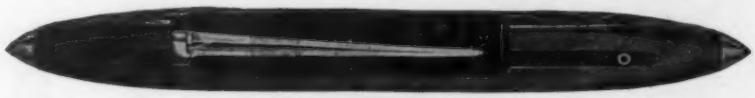
Never-Slip Cop Tube
Patent applied for

Patented in the United States and all Foreign Countries

Filling-Waste is reduced to nothing and long Cops will only be a success if our Never-Slip Cop Tubes are used in connection with our Never-Slip Cop Spindles. We can guarantee that with our combination of Never-Slip Cop Spindles and Tubes, looms can be run with longer cops than used at present, at a much faster rate of speed



Shuttle with Spindle Raised
U. S. Patents: 778851, Jan. 3, 1905; 790611, May 23, 1905; other patents pending



Shuttle with Spindle Lowered.
U. S. Patents: 778851, Jan. 3, 1905; 79611, May 23, 1905; other patents pending

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American Textile Specialty Machinery Co.

363-373 Rider Avenue, New York City
NEAR MOTT AVENUE SUBWAY STATION

Electric and Automatic
Warp Stop Motion for Silk, Wool and Cotton
Simplicity! ***Perfection!***

HARWOOD'S MACHINERY

Increases Production, Improves Quality, Decreases Labor Cost.

Aprons of All Kinds

We build about thirty different styles of spike aprons adapted to the various kinds of stock our feeders are called upon to handle. Our policy is and will be to put in our aprons the **best** materials and workmanship money can buy. We know we could make cheaper aprons by using cheaper materials and less expensive labor, and it would take manufacturers some years to find us out. The apron would LOOK nearly as well, but would WEAR only two or three years instead of from five to ten or twelve. Do not trust the man who says he can sell you aprons cheaper than we can. He can do it (and so could we), but you pay the bill in the end. The best is none to good and is the cheapest in the long run.

Call on us for particulars and information about all matters relating to Feeding Machinery.

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53 State Street, Boston, Mass.

Cloth Washers, Dye Tubs, Vats, Fulling Mills,
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Brass Founders, Tanks, To Order.

Hopkins Machine Works, Inc.

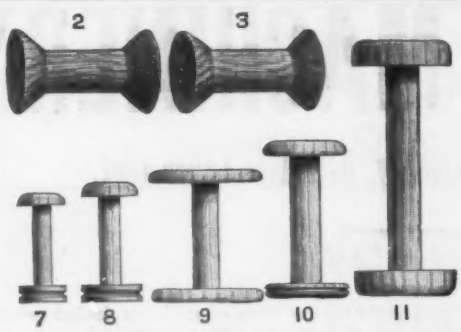
BRIDGETON, R. I.

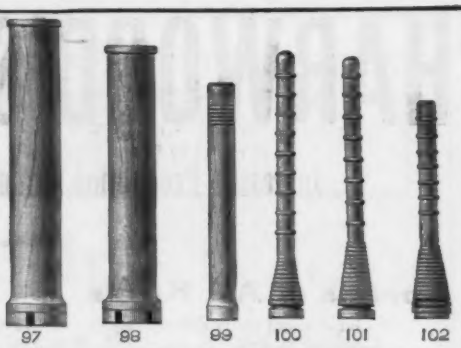
Providence Office, 49 Westminster St.

Spindles and Flyers, for Cotton, Wool, Silk, Flax, etc.

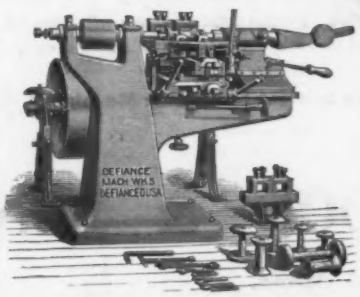
Send for our latest Catalogue and Price List

Dye Tub Valves, Cloth Guides, etc. Bronze or Porcelain Rings.



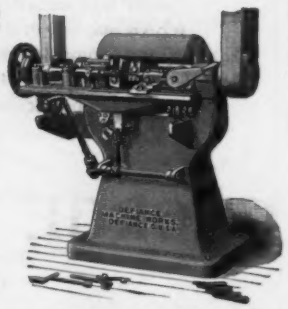


SPOOL AND BOBBIN MACHINERY



AUTOMATIC SPOOL TURNING LATHE

Complete Equipment
OF THE
MOST MODERN TOOLS
25% SAVED
Over the Old Methods
Send for Catalogue and Particulars to
THE
Defiance Machine Works,
DEFIANCE, OHIO



AUTOMATIC BOBBIN LATHE

How Many 6-inch Belts Have You?

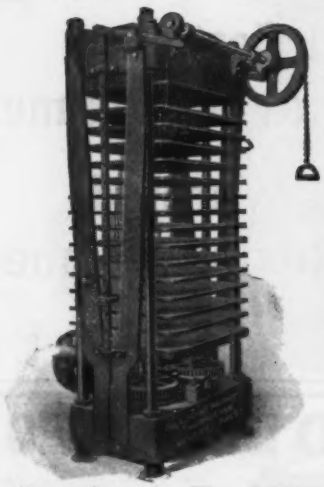
Do you know you can Lace 500 of them Free of Charge by getting a

Jackson Belt Lacer?

And lace each belt in three minutes? And do it in such a way that the belts can be shortened or lengthened in a few seconds to meet any emergency? And that the lacing won't break? And that it passes over the smallest pulley without noise, slipping or friction? If you don't know these things, it's because you've missed five minutes very pleasant reading of a little booklet we send to interested parties. Better send for it to day and learn about this free belt-lacing proposition.

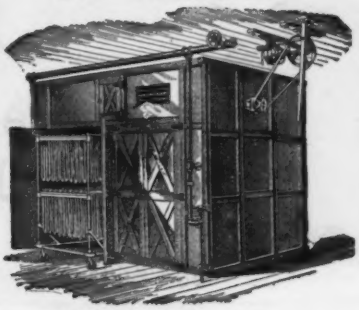
Birdsboro Steel Foundry & Machine Co.
Birdsboro, Pennsylvania.

"HURRICANE" DRYERS AND FANS



Power Screw, Hydraulic and Lever **Presses**

For Wool, Cotton Stock, Yarn, Stockings, Underwear, Etc.



Truck Yarn Dryer.

BELT DRIVEN AND MOTOR DRIVEN

"Hurricane" Fan, Style No. 2. Write for Catalogues.

COMPLETE EQUIPMENTS FOR DYEING, SCOURING, BLEACHING, CARBONIZING, OXIDIZING, CHROMING, Etc.

PHILADELPHIA DRYING MACHINERY CO.

6721 Germantown Ave., Philadelphia, Pa.

Fairbairn Lawson Combe Barbour, Ltd.

LAWSON BRANCH,

Hope Foundry. LEEDS. England.

MAKERS OF MACHINERY FOR

PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

GOOD'S COMBINED HACKLING AND SPREADING MACHINE,

LONG REACH SCREW-GILL DRAWING FRAMES,

CHAIN-GILL DRAWING FRAMES with Apron Head,

PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,

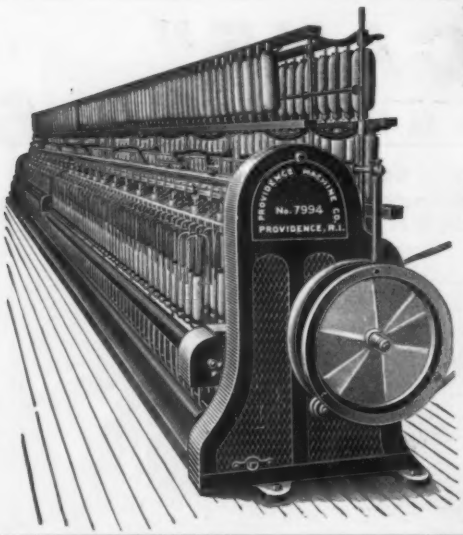
AND OTHER

Special Machinery for the manufacture of Rope Yarns and Binder Twine.

IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS

BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.



Providence Machine Co.

Manufacturers of

Improved Cotton Roving Frames

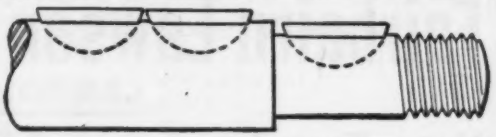
Improved Worsted Roving Frames

564 Eddy St., - - PROVIDENCE, R. I.

REVOLVING FLAT CARD BRUSHES

S. A. Felton & Son Co. FOR USE ON ALL MAKES OF REVOLVING FLAT CARDS Manchester, N.H.

Key Seating Attachment FOR Whiton Gear Cutter



We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

THE D. E. WHITON MACHINE CO.,
19 Oak Street, New London, Conn.

THE L. M. BOWES COMPANY,

Every Description of Fine Leather for Textile Use.

SOLE AGENTS IN THE UNITED STATES FOR

CHARLES CAIN, SON & GREENWOOD,
HALIFAX, ENGLAND.

MAKERS OF HIGH GRADE

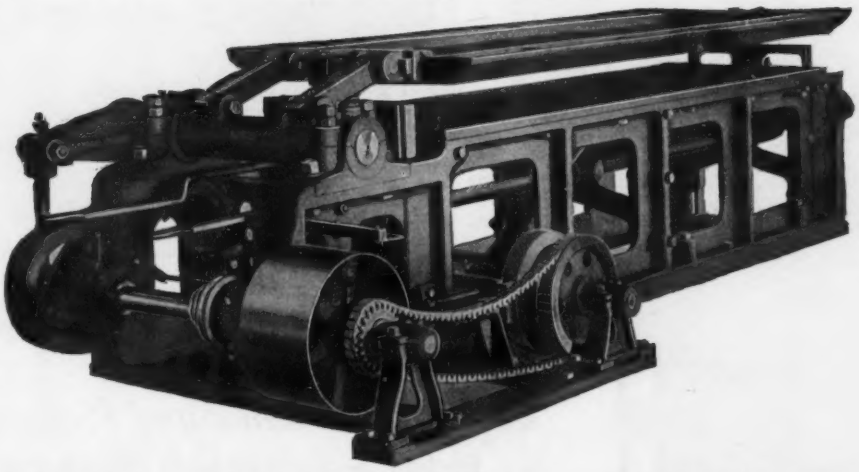
CARD CLOTHING

For Cotton, Woolen, Worsted and Silk.

451 ATLANTIC AVENUE, - - - - BOSTON, MASS.

Farrel Foundry & Machine Co.

ANSONIA, CONN.



SINGLE AND DOUBLE FELT HARDENERS.

Chilled and Soft Iron Rolls. Heavy Transmission Machinery.
Machine Moulded and Machine Cut Gearing, to 20 ft. diameter, Etc., Etc.
Heavy Castings, in Gray Iron or Semi Steel.

CHARLES S. BARTON, Pres. and Treas.
GEORGE S. BARTON, Secretary.

Established 1837.
Incorporated 1867.

Rice, Barton & Fales Machine and Iron Company.

MANUFACTURERS OF

Printing Machines

From ONE to FOURTEEN COLORS,
for ALL KINDS OF FABRICS.

ALSO

Duplex Printing Machines, | Forcing Machines,
Color Kettles, | Copper Printing Rollers,
Winders for Greys, etc.

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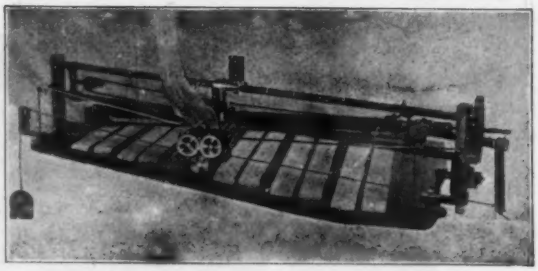
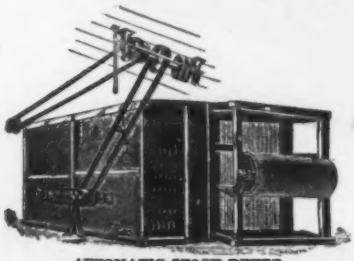
"20th CENTURY" MACHINERY

Dryers for Wool and Cotton Stock, Yarn, Stockings and Underwear. Carbonizers, Ventilating Fans, Yarn and Wool Scouring Machines, Cloth Washing and Dyeing Machines, Tom Toms, Chroming Oxidizing Machines.



WEB FEED.



AUTOMATIC STOCK DRYER.

We also manufacture Kershaw's Geared Traveler and Improved Web Feed.

Garnett Machines and Pickers.

We Recloth or furnish New Metallic Toothed Cylinders and Feed Rolls.

AMERICAN DRYING MACHINERY CO.,
19th and Westmorland Sts., Philadelphia, Pa.

Telegraphic Address: "WHITELEY, HUDDERSFIELD." Nat. Telephone, 598 and 599.

Wm Whiteley & Sons Ltd.

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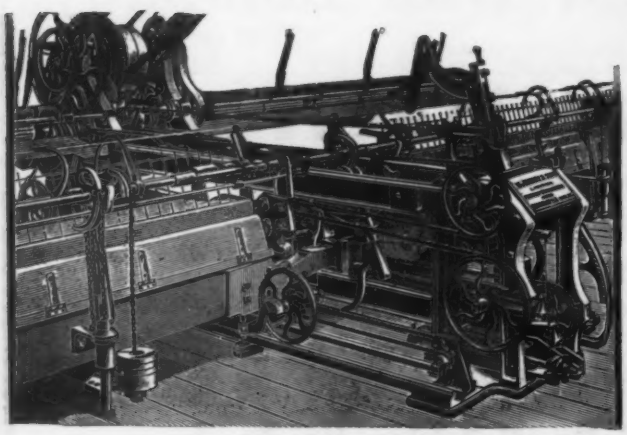

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Makers of all descriptions of Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

Cross Raising Machines, Wool Scouring Machines,

Hydro Extractors. Warp Sizing.

Cool Air Drying and Beaming Machines.

Warping Mills with Patent Sectional Dividing Apparatus.

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Second-hand Tentering Machines in good repair at low prices.

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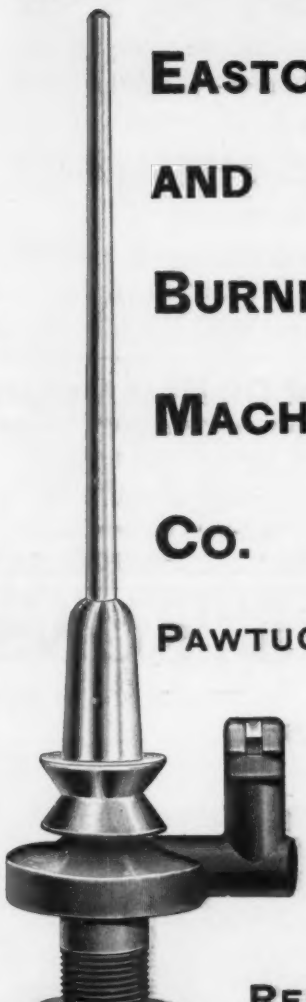
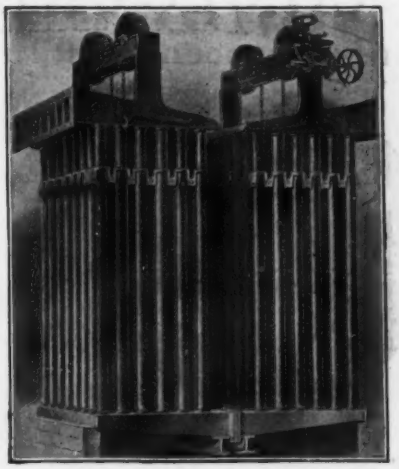


EASTON AND BURNHAM MACHINE CO.

PAWTUCKET, R. I.

REPAIRS FOR RABBETH SPINDLES



Green's Air Heater

recovers the waste heat in the boiler flue gases so that it may be applied to Drying, Flax, Wool, Paper, Sugar, Timber, Grain, Fabrics, Clothes in Laundries, etc., and for heating shops and buildings. It is also used in water-gas plants, as at Newburgh, N. Y., to recover the heat in the escaping gases when "blowing-up" By actual tests it has shown savings of 12 to 15% of the total fuel used.

The heater is constructed much like a Green Fuel Economizer, except that the air is forced through groups of tubes arranged in series instead of all tubes at once in parallel as in the Economizer This is shown in the illustration above. The cold air enters the heater at the end near the chimney, where the flue gases are the coolest, and leaves from the group of tubes at the boiler or furnace, where the flue gases are the hottest. In this way the greatest average difference of temperature between the gases outside and the air inside and, consequently, the greatest efficiency in heat transmission, is obtained. The exteriors of the tubes are kept free of soot by automatic scrapers, as in the Economizer. Where water is to be heated, as well as air, the Economizer and Heater may be installed together.

In an 8 hour test upon a Heater containing 250 pipes the following results were obtained:

Air per minute entering at 54° F	4616 cu. ft.
Final temperature of air	201.6° F
Temperature of flue gases entering Heater	512° F
Coal used per 8 hours	5150 lbs.

The heat taken up by the air per minute is 12,642 B. T. U., equal to 14% of the heat recovered in the boilers.

As the boilers would use in a year of 300 days 772 tons of coal, the Heater does work to the extent of 14% of this, or 108 tons, worth at $4.00 per ton, $432. This is an income of about 23% on the cost of the Heater. Where it is not required to make the air so hot a still higher efficiency may be obtained. Write for Pamphlet "TW" on the Air Heater, and ask also for our Catalog of Fans, Blowers, Exhausters and Steam and Hot Water Heating Coils.

The Green Fuel Economizer Co.

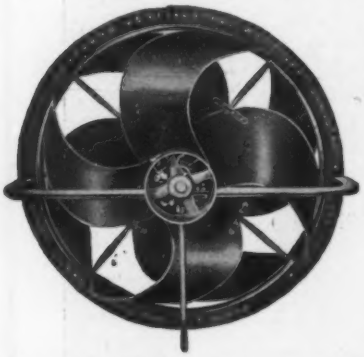
MATTEAWAN, N. Y.

GEO. H. GIBSON CO. PARK ROW NEW YORK

(Sole Builders of the Green Fuel Economizer in this country.)

COMPOUND—THAT'S WHY

Barney Compound Ventilating Fans Ventilate, Purify, and Dry.



Notice the compound feature—it does the work. They force out all atmosperic impurities and draw in pure air. They often double capacity of drying rooms, expel loose steam from dye houses—preventing condensation, *cool spinning rooms.*

The Barney System is the most economical.

TELL US YOUR PROBLEM.
WRITE TODAY. FREE TRIAL OF FAN.

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SAVE MACHINERY POWER OIL

Dust Proof Oil Hole Covers
are a dividend paying investment

Their use largely increases machine efficiency by insuring clean oil on every bearing all the time. See that they are on all your machinery whether you build or buy.

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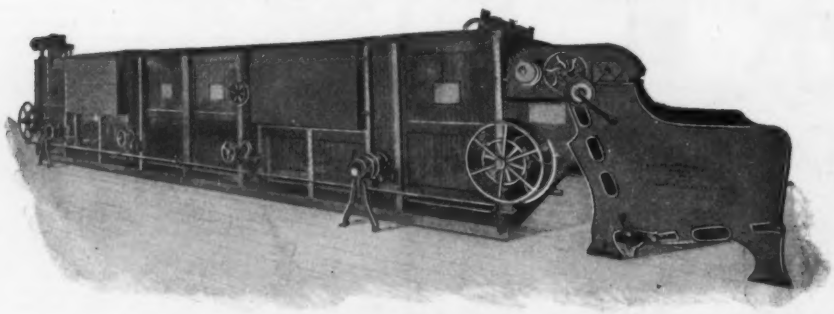

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Stock Dryers, Wool Washers,
Wool Dusters, Carbonizing Plants,
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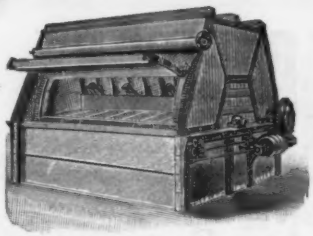

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MACHINES
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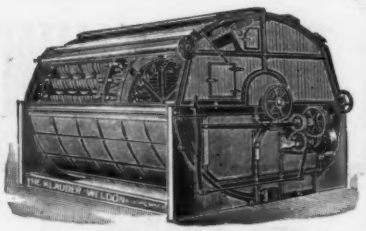
2 MONTHS' TRIAL
YOU
TAKE
NO
RISK



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THE KLAUDER-WELDON DYEING MACHINE COMPANY

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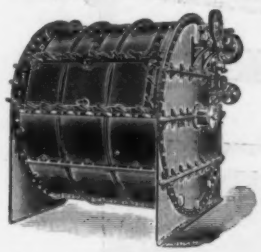
Machines for Dyeing, Bleaching and Scouring Woolen, Worsted, Cotton and Silk Skeins—Slubbing—Raw Cotton and Wool, Waste, Rags, Shoddy, Hosiery, Underwear, Hats, Caps, Knit Cloth, Tapes, etc.



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Special Machines for Sulphur Colors

WILL EARN THEIR COST IN
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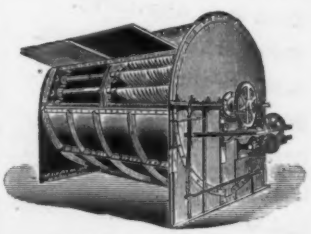
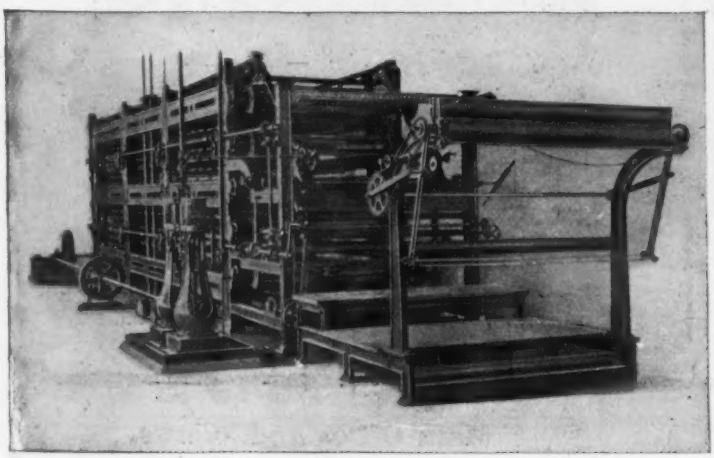
IN FROM
6 TO 12 MONTHS
ACCORDING TO CAPACITY



SULPHUR SKEIN MACHINE.

TENTERING AND DRYING MACHINES

WITH LOW DOWN FEED. **PATENTED FEBRUARY 26, 1895.**



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For Extracting Water From Cloth.

Type A

Extracts thoroughly and uniformly. Requires fully 70 per cent. less power than Centrifugal Extractors.

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The "STONE DRYER," for Wool, Cotton, Rags, Etc.

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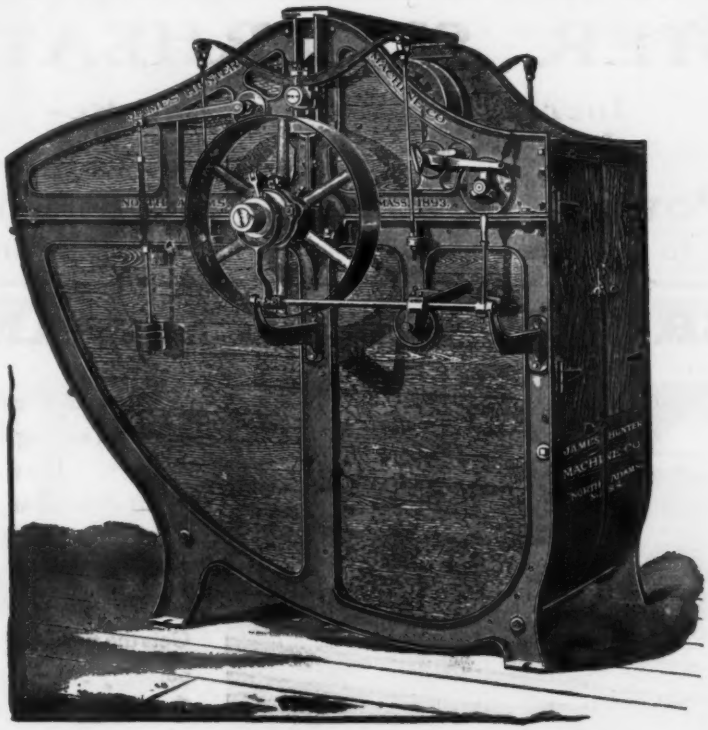

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Increase Efficiency and Reduce Cost of Operation.

Power Specialty Company,

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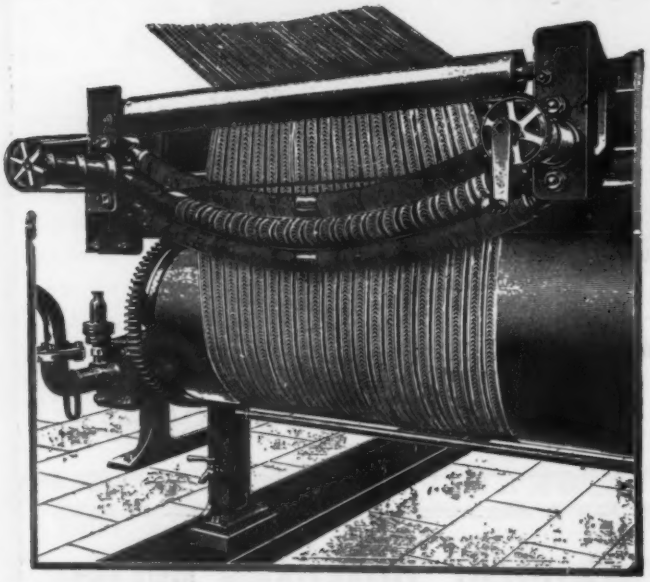
A PERFECT CLOTH EXPANDER



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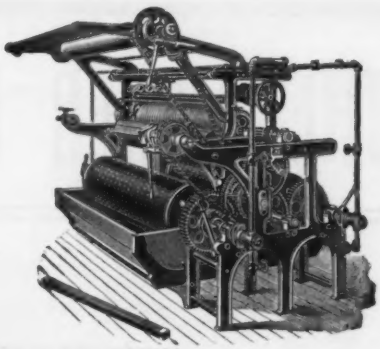

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For Face Lustering

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It is Light, STRONG, and lasts a lifetime.
It clamps to the shaft perfectly — keys and set-screws superfluous.
Interchangeable metal Bushings to fit shafts of different sizes.
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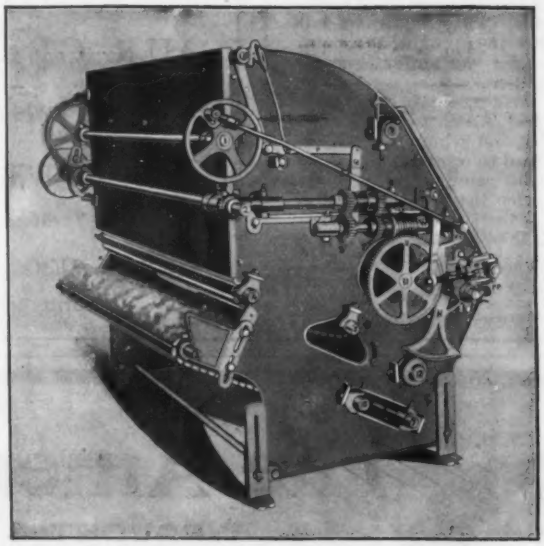

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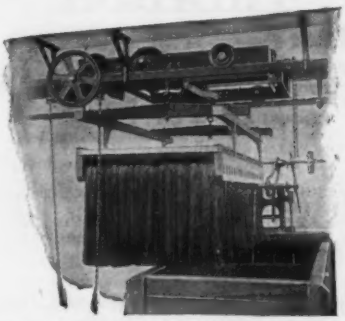
Woonsocket Machine and Press Company

WOONSOCKET, R. I.

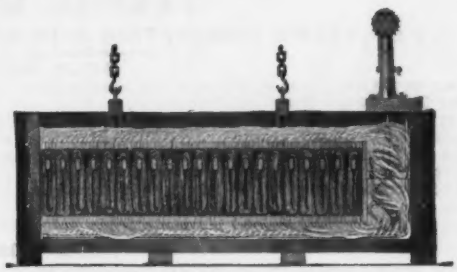
The Hussong Dyeing Machine

Patented Nov. 6, 1900. April 9, 1901. Nov. 29, 1904. June 5, 1906.

THE ONLY MACHINE THAT WILL DYE SUPHUR BLACK SUCCESSFULLY.



This illustration shows our Compressed Air Hoisting Carriage, with 300-pound Yarn Machine suspended.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation

Points of Superiority Which We Claim for the Hussong Machine.

Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
Saving of 75% in Labor, Makes No Waste Whatever, No Friction on the Material.
Requires but Little Power to Operate.
Leaves the Yarn and Slubbing it its Natural Condition.

Built by the **American Dyeing Machine Co.** Office 609 Pearl St., Camden, N. J.

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The Hogg Patented Card Feeders

for woolen and worsted cards are not an imitation but a radical departure in card feeding.

Our feeders have all the good features experience has found necessary in card feeding.

They combine simplicity, strength, durability and unformity in quantity and quality.

We guarantee the results and allow you to judge its value to you in your mill.

We positively guarantee that our Feeders will not sort or separate the long and short stock, which insures more perfect goods.

Positively no rolling or balling of the stock, which preserves the spinning quality of the fiber.

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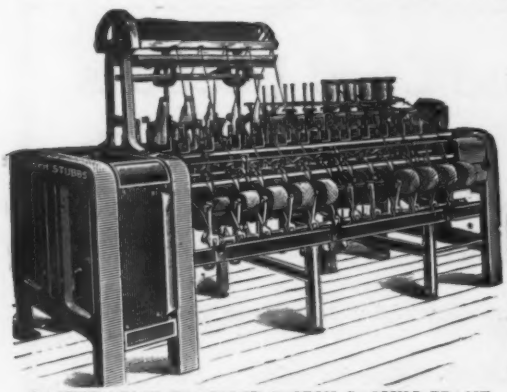
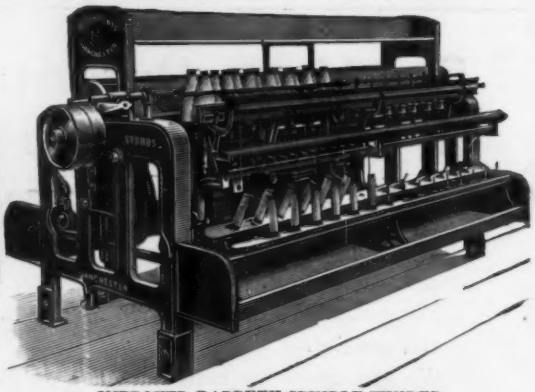
For Winding, Gassing, Reeling, Preparing, Polishing and Bundling Yarns.



PATENT QUICK TRAVERSE COTTON GASSING FRAME.



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With Patent Tapering Motion, for Single Flanged Bobbins.

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The Only Perfect System of Air Moistening

And Has Been Adopted by the Representative Manufacturers of this Country.

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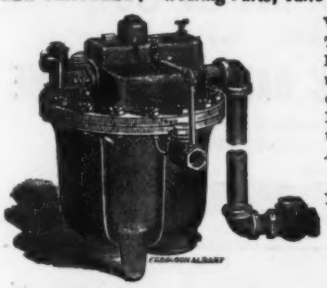

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We manufacture Steam Traps for all duties, High and Low Pressures, returning the Condensation back into Boiler or Discharging to Hot Well, Tank, or Atmosphere.

No Elastic Gaskets, all Joints Ground Metal and Metal.

SEND FOR **Catalogues A, B and C**

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ALBANY, N. Y.

Established 1870.

FRED'K TOWNSEND, Pres. JAMES H. BLESSING, Gen. Mgr.

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THE BEST FIRE HOSE MADE.

(Trade Mark.)

For use in **Cotton Mills, Woolen Mills and Factories.**

Seamless Woven and Rubber lined EUREKA COTTON HOSE, has no equal. Send for circular and testimonials.

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Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine

It is especially adapted for use in Cotton and Woolen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

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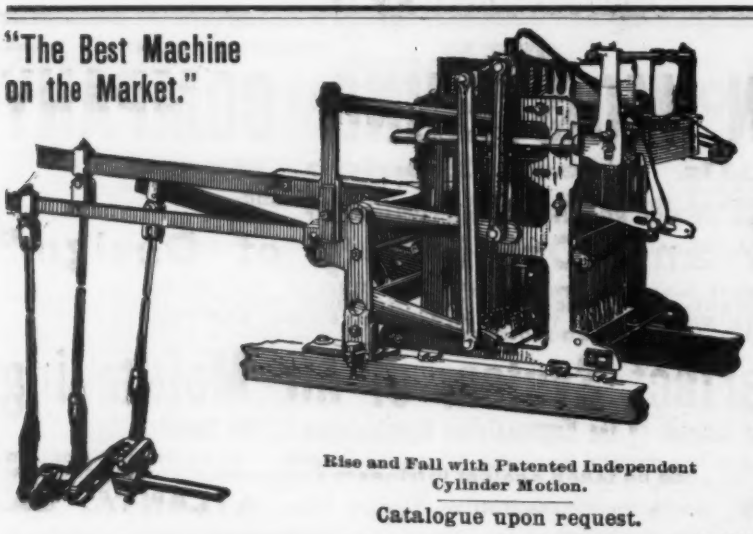

Rise and Fall with Patented Independent Cylinder Motion.

Catalogue upon request.

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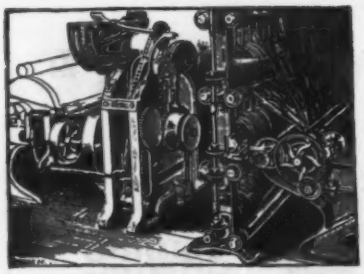

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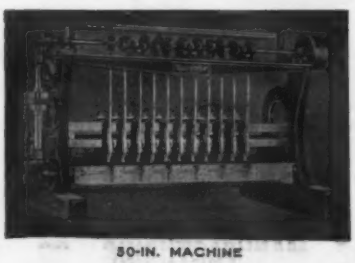

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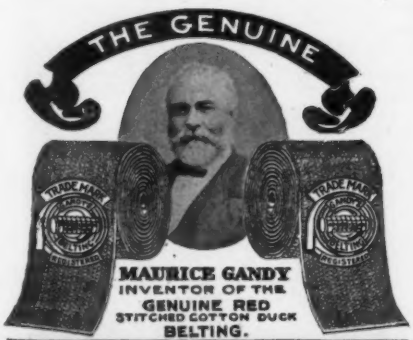

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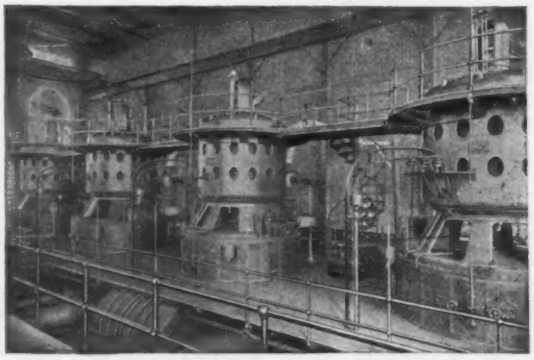

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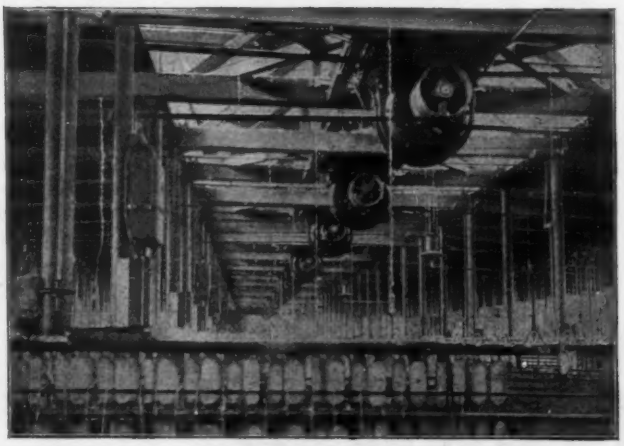

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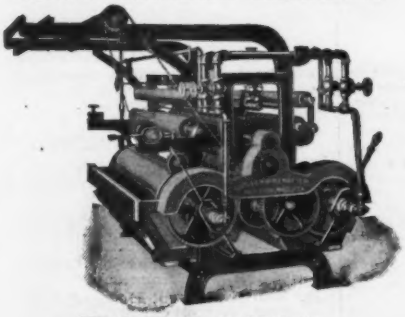

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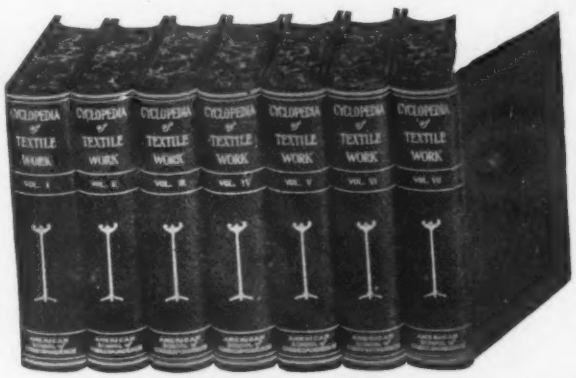

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Louis A. Olney, Head of Department of Textile Chemistry and Dyeing, Lowell Textile School.

M. A. Metcalf, Managing Director, "The Textile American."

H. William Nelson, Head of Department of Weaving, Lowell Textile School.

John F. Timmermann, Formerly with Central Woolen Company, Wilton Woolen Company, etc.

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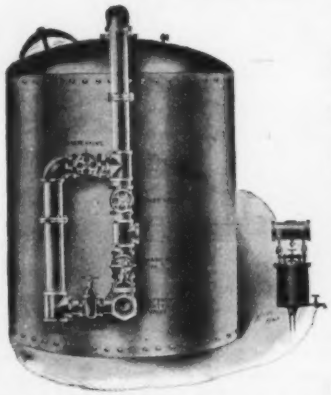

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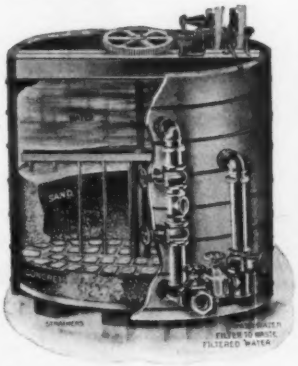

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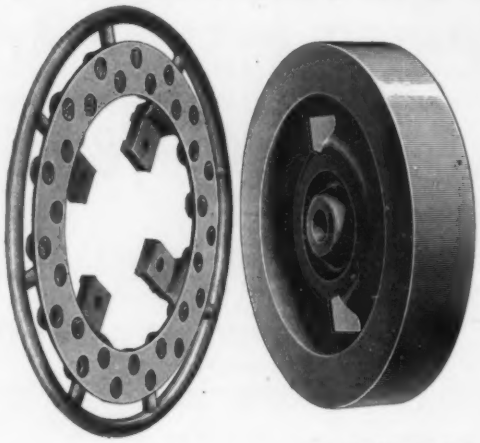

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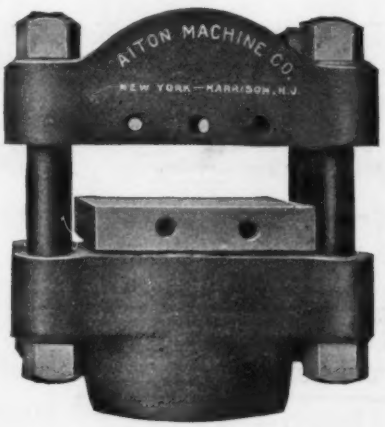

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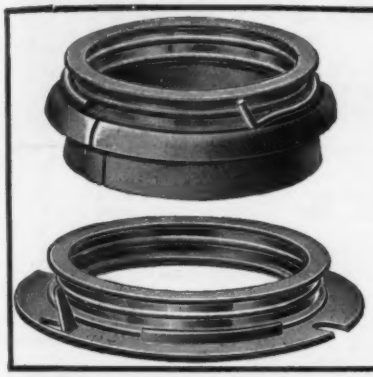

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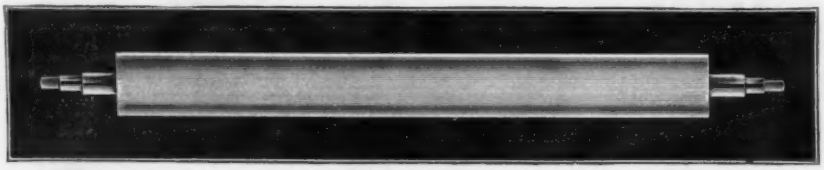

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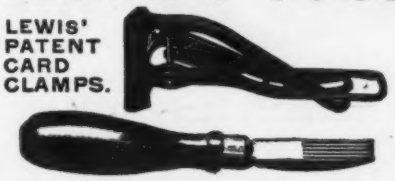

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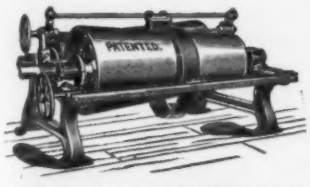

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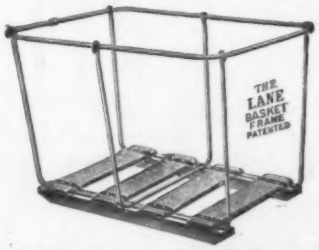

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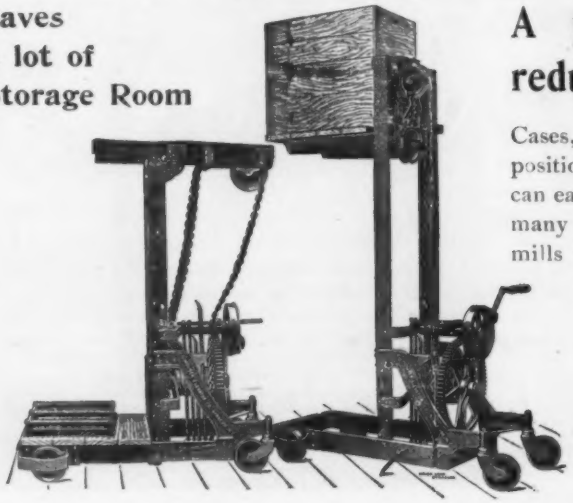

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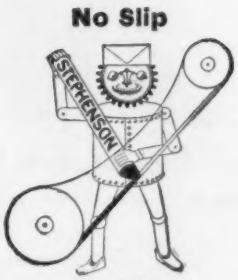
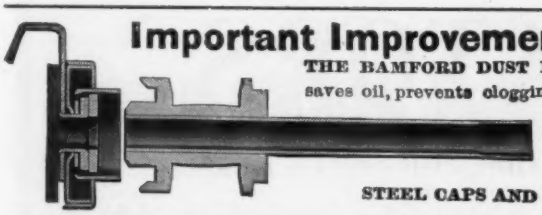
Albany, N. Y.



Important Improvement in Worsted Spinning.



THE BAMFORD DUST PROOF and SELF-LUBRICATING SPINDLE TUBE saves oil, prevents clogging with dust and lint, thereby insuring longer life to the tubes, saves labor, maintains uniform speed, and most important of all, makes PERFECT YARN. Refer to largest worsted mills.

BAMFORD & SMITH, Pascoag, R. I.

ALSO MFRS. OF
STEEL CAPS AND SPINDLES. **Caps, Flyers, Tubes, etc., Repaired.**

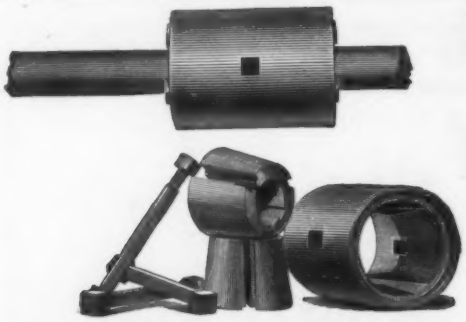
THIS TRADE-MARK

on a rawhide pinion corresponds to the Sterling mark on silver—it denotes the highest degree of perfection. New Process Raw Hide Pinions are the recognized standard of excellence. Owing to patent and secret processes of curing the raw hide, they contain much more of the vital fibre than other raw hide, and **wear like iron.** They provide a **noiseless positive drive**—no noise, no loss of power. Get our free booklet for the facts.

We also make accurately cut and planed Metal Gears, in Spurs, Bevels, Internals and Racks.

The New Process Raw Hide Co., SYRACUSE, N. Y.

MORRIS & WALES, PHILA.



THE "SELLERS" MAKE OF

DOUBLE CONE VISE COUPLING

has a way of holding shafts together, that no other COUPLING can equal.

WILLIAM SELLERS & CO., INCORPD.

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Makers of

SHAFTS,
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PULLEYS,
HANGERS,

and all most approved appliances for the Transmission of Power.

SEND FOR CATALOGUE AND PRICE LIST.

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INJECTORS. POWER CRANES.

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ELEVATORS

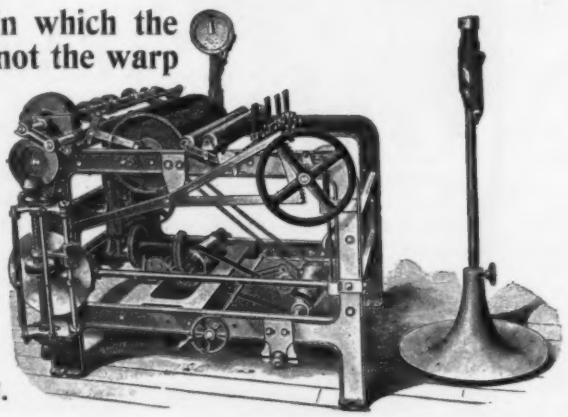
ESPECIALLY ADAPTED FOR MILL USE.

SEND FOR ILLUSTRATED CATALOGUE AND ESTIMATE.

A Direct Ribbon Warper in which the warp spools traverse and not the warp

The longest traverse is eight inches, the shortest three inches, the fastest is one inch to each revolution of the warp spool, the slowest one-eighth of an inch to each revolution. Each motion is independent of the other — either can be changed without stopping the machine.

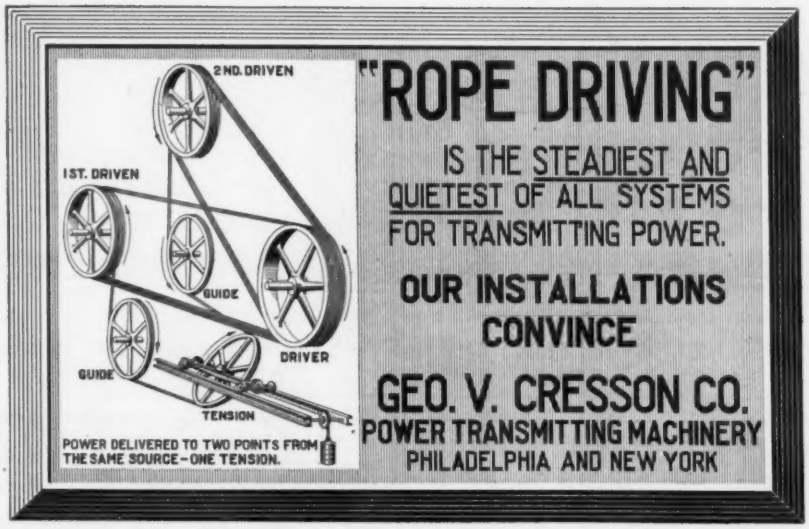
A machine making two warps of the longest traverse or four of the shortest at the same time $200.00. One making four long or eight short at same time $225.00.



Charles H. Knapp

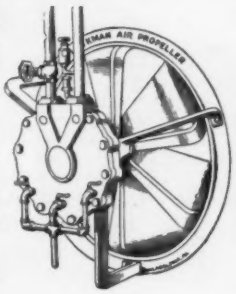
Cor. Wait and Rye Sts. Paterson, N. J.

BULLETIN ON ESSENTIALS OF ROPE DRIVING



NOW READY FOR DISTRIBUTION. SEND FOR COPY

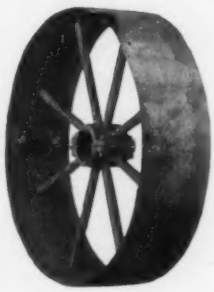
Effective Economical **BLACKMAN FANS** clear foggy dye houses dry material rapidly



Move air at the rate of 16,000 cubic feet per minute, per horse power. Greatly improve Dye Houses conditions. Owing to the shape of the blades which give the necessary hold on the air to force it through the material without decreasing the volume of air moved they give most economical results in drying. Send for particulars.

E. M. Nichols, 639 Arch St., Philadelphia, Pa.

Each half section is one solid piece of steel—the Latshaw is built for hard service



It has a very strong hub, small spokes which offer little resistance to the air, weighs only about half as much as a cast iron pulley, is fitted with interchangeable metal bushings that fit shafts of any size within reasonable range and these are only a few of the reasons why the Latshaw gives more and better service for every dollar of its cost than any pulley made. Write for more reasons.

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Perfect oils for particular purposes.

Various kinds of goods call for varied treatment. No one oil is adapted to all kinds of goods. To meet these requirements, we make various grades and there is "**Breton**" efficiency in everyone.

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INCORPORATED

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Improved Woolen, Worsted and Cotton Reels, Ring Twisters, Spoolers, Balling Machines, Sun Gill Boxes, Gill Box Screws, Fluted Rollers of all descriptions, Butterworth Rag Pickers and Lumpers, also all Repair Parts for Pickers, Collars and Steps for Self-acting Mules, Setting up and Lengthening Self-acting Mules, Movers and Erectors of all kinds of Cotton, Woolen and Worsted Machinery.

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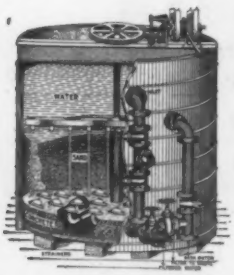

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An organization of experts in the various departments of water purification, giving especial attention to the engineering and chemical problems involved and offering its services as contractor to those wishing to install a water purification plant for any purpose with the assurance of obtaining maximum results and the most advanced ideas.

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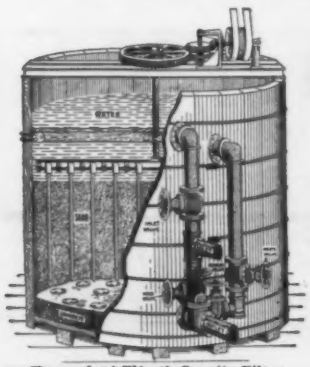

Hungerford-Elfreth Gravity Filter.

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WATER SOFTENERS INTERMITTENT and CONTINUOUS

There is only one Filter, the

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the only filter which exceeds its guarantee.

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Leviathan Belting.

How did I first come to try it? Why one day I came across one of those "booklets" that these "Leviathan people" are so everlastingly asking you to "ask for" and I saw in it a testimonial that captured me. It was from a mining engineer whom I knew to be thoroughly "down-to-date," and an extra keen, close fisted, always-gets-his-money's-worth buyer. What he said cut a whole iceberg with me, and a few weeks later I ordered a "Leviathan" to try. That's how I was inoculated. Possibly that same booklet might "Leviathanize" you.

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Sewing Machine Belting, Press Boards, Belt Hooks, Lace Leather, Leather Belting, Latch Needles, Oilers of every description, Mill Baskets and Brooms, Mill Banding, Rings and Springs, Packings of all kinds, Fire Pails, Shears and Trimmers, Cloth Knives, Etc.

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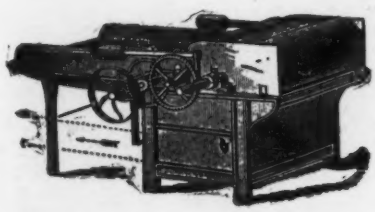

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Improved Cloth Measuring Machines.

Lumper and Duster Cylinders Refilled and Repaired.

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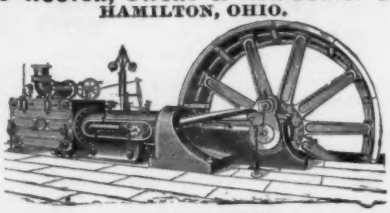

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Simple, Compound and Condensing, of any size, for all purposes.
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Tanners and Manufacturers of
SUPERIOR COMBINATION TANNED and OAK-TANNED LEATHER BELTING
Apron & Belting Butts, Worsted Comb & Gill Box Aprons.
Mill Supplies, "Tau-Bo" Rawhide Picker Leather.
Tensile strength of Combination Tanned Belting is nearly 100 per cent. greater than best Oak Leather made. It is pliable and will transmit 50 per cent. more power; a 90 days free trial belt will prove this fact.
Tannery & Factory, NORWICH, CT. 134 Congress St. Boston, Mass. 11 Dorrance St. Providence, R.I. 33 N. Canal St. Chicago, Ill.

Official American Textile Directory.

The TEXTILE WORLD RECORD, which for years has compiled and published the ANNUAL OFFICIAL DIRECTORY OF THE TEXTILE INDUSTRIES, has bought the AMERICAN TEXTILE DIRECTORY, and merged the two Directories, retaining the special features of each, and with the combined subscription and sales list of both.

It is published in two editions, viz.: the Office Edition, price, $3.00, and the Travelers' Edition, smaller in size, with thin paper and flexible binding, price, $2.00. The combination price for the TEXTILE WORLD RECORD and DIRECTORY is $3.00 per year with the Travelers' Edition, and $4.00 per year with the Office Edition.

The 1906-7 Edition is ready for prompt delivery.

CONTENTS.

THE MAP FEATURE was originated by the Textile World in 1894, and is copyrighted. There are 19 of these textile maps, which show only the cities and towns where there are textile establishments.

A COMPLETE DIRECTORY OF MILLS including Cotton, Woolen, Knitting, Silk, Flax and Jute Mills of the United States, Canada and Mexico, together with the Dyeing and Finishing Works, Bleacheries, Print Works and other Textile Establishments.

Full information is given about each mill in almost every instance, viz.: the name of the company or firm, names of officers, agent, superintendent, the character of goods made, the machinery equipment, i. e., the number of sets of cards (or combs), the number of spindles, number of looms; whether the mill uses steam or water power, whether there is a dye house or not, the names of the selling agents or if the mill sells direct, and in many instances the name of the man is given who buys the raw material and supplies. In this section of the Directory, all the mills in one place are arranged under the head of that town, but so designated that the kind of a mill is determined at a glance by boldface letters, so that a person looking, for instance, only for woolen mills, can pick them out at a glance. This system of arrangement is conceded to be the most convenient of any, as it groups all the mills in one town together and is self-indexing, while at the same time those interested in a particular class of mills, such as cotton, silk or knit, can find them as easily as if they were classified separately.

AN ALPHABETICAL INDEX to the textile establishments in the United States.

MILLS WITH WORSTED MACHINERY. A separate list is compiled of mills with worsted machinery for the convenience of those dealing exclusively with that branch. This is a feature unique in this Directory.

THE TEXTILE MILLS IN MEXICO. This feature of the American Textile Directory is continued and brought up to date by the latest information.

THE YARN TRADE INDEX. In this department are classified lists of manufacturers of different kinds of yarn who spin for the market. It gives the size of yarn spun and the form in which the yarn is put up, together with the selling agents of the mills, or, if sell direct.

COMMISSION AND ORDER SECTION. In this department are classified lists of establishments doing dyeing, bleaching, printing, finishing, and mercerizing on order, sub-divided according to the class of work done.

RAW MATERIAL SECTION. In this department are complete lists of dealers and brokers in wool, cotton shoddy and extracts, and wholesale rag dealers.

SELLING AGENTS AND DRY GOODS COMMISSION HOUSES in the principal cities of the United States, giving the character of goods handled

MANUFACTURING CLOTHIERS in the principal cities, buying from first hands, giving the class of goods made and in most instances the name of the buyer.

SUIT AND CLOAK MANUFACTURERS in the principal cities, buying from first hands, giving the class of goods made and in most instances the name of the buyer.

MACHINERY AND SUPPLY SECTION. This contains a carefully classified index of over seven hundred builders of textile machinery and dealers in mill supplies

LORD & NAGLE COMPANY,

PUBLICATION OFFICE, . . . 299 DEVONSHIRE STREET, BOSTON

Drying textiles the right way

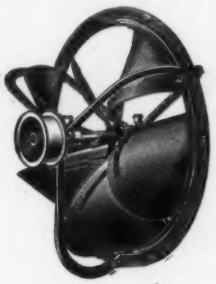
Means more than just getting them dry. It includes many other things that have a direct effect on the profit account.

A Berry Wheel

Not only increases the output — but improves the finish as well. It is unsurpassed for drying all kinds of textiles.

Ask those who use it — they know.

This is our Berry Wheel, the most effective agent for moving air, eliminating steam and other impurities in the atmosphere.



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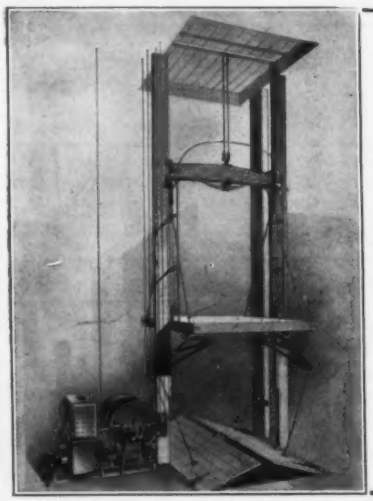
BOSTON.



A New Type of

Electric Freight Elevator

at a moderate price.

This elevator is considerably cheaper than our standard direct electric machine and costs but little more than our belt connected machine.

Capacities:

2500 lbs. at 55 ft. per minute.
(Without trap-doors.)
2000 lbs. at 75 ft. per minute.
1500 lbs. at 100 ft. per minute.

Steel worm, bronze rimmed gear wheel Ball bearing end thrusts.

Motor of our own make especially designed for elevator service, compound wound, slotted armature core.

If interested in elevators write us.

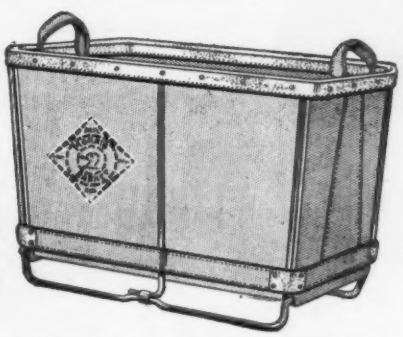
Morse, Williams & Company,

Department of Otis Elevator Company.

Philadelphia Baltimore | New York Pittsburgh | Boston Atlanta

Get the best— Morris Duck Mill Baskets

The American Woolen Company bought for their Assabet Mills, Maynard, Mass., 225 baskets like the one here shown. This and our other styles are used in the biggest and best mills.



Our improved steel frame construction makes them flexible and yet gives great strength. For the details get our booklet on baskets — it shows different styles.

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and other devices for regulating pressures of steam, air and water.
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ALBANY GREASE

AND WE ARE THE ONLY MAKERS.

We have solved the problem of economical lubrication.

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OUR SPECIAL OFFER, a Sample Can of Albany Grease with an Albany Grease Cup free of charge or expense for testing. Always give the name of concern. The only information necessary to send is pipe connection in bearing, DEPTH OF OIL HOLE FROM TOP OF TAP TO JOURNAL, and give particular part of machinery on which the same is to be used.

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We can cheaply and effectually give a quality of water that will leave nothing to be desired. Scale and Corrosion *in* Boilers *will also be prevented.*

Let us place our Catalogue before you.

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The Vulcan Roving Can prevents broken ends

in roving by its smooth, glossy inside finish and true running on the card table. The body is made of the best chemically treated fiber which has many of the qualities of rawhide. All rivets are burred so they cannot draw out. Rings are made of steel and have rounded edges. Every can is accurate in size and perfectly round. They are built for long continued satisfactory service. Write for prices and list of users.

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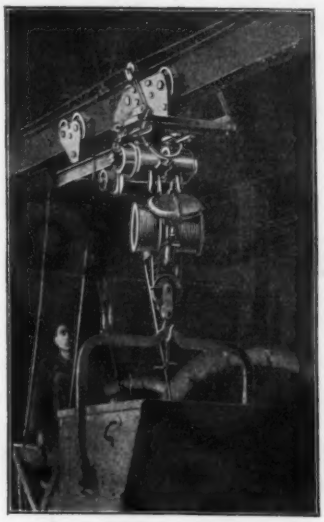

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Manufacturers and Repairers of

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Mill and Machine Brushes

For Textile, Paper Mills, Etc.

Write for Catalogue. WORCESTER, MASS.

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Manfrs of *BRAIDING MACHINES*

for making Dress Trimming Braids, Cotton Tapes, Underwear Braids, Shoe Laces, Spindle Banding, etc. Winders, Doublers, Measuring Machines, Reelers, Singeing and Finishing Machinery. Special Machinery.

There is but one "Cyclone" Dust Collector, The No-Back-Pressure, "1905."

In the old Cyclone the in going air from fan must be forced back of the vertical whirl, held confined by the tubular guard and stronger than the in coming air.

RESULT

You have 50% back pressure on fan.

You lose one half the power.

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Efficient Power Pumps.

are operated at a saving of from 50 to 60% over the actual cost of operating steam pump,—is this not worth while looking into. Write us for catalog.

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are acknowledged the highest in efficiency of any pumps built. We build them exclusively for all operations—Tank Pumping, Dye Houses—Bleacheries, Cotton Mills, etc.

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OF EVERY KIND AND DESCRIPTION
Also Power Transmission Supplies for General Mill Use.

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Oil Separator

MOTOR WOUND FOR ANY VOLTAGE.

Separates oil from bolts, nuts, and scraps of all kind—oil that would otherwise be wasted, and makes it as good as it ever was, for further use. **Send for Catalogue.**

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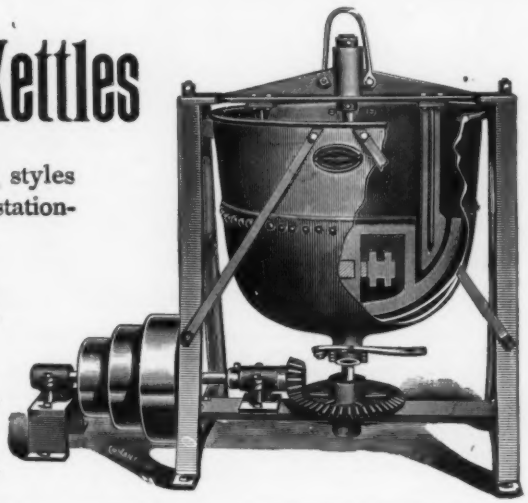
Steam Jacket Mixing Kettles



This cut represents one of our many styles of steam mixing kettles, made with stationary and removable stirrers.

E. B. BADGER & SONS CO.,

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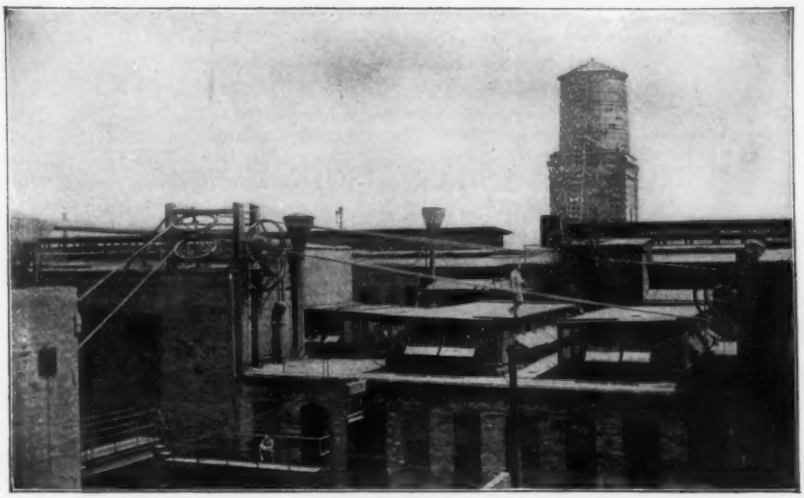

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PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers' names. A list of city offices of textile mills is given.

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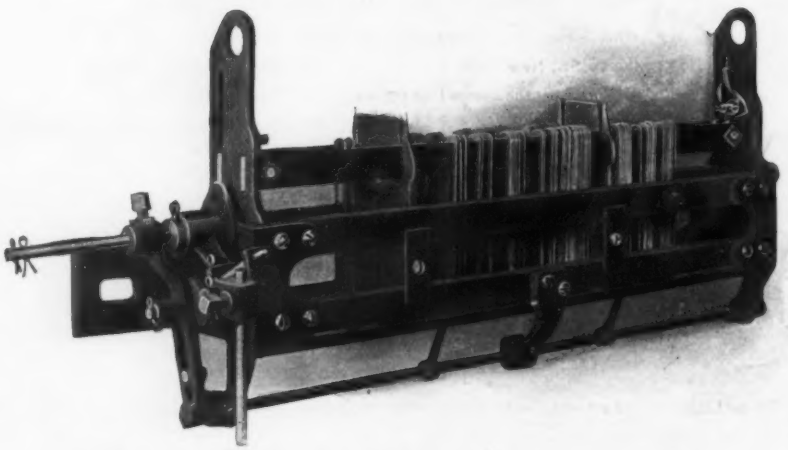

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Monthly Comment.

Keeping Track of Orders.

This important subject is discussed by Edward Arnold in this issue in the article entitled, An Order Book for a Woolen Mill. The importance and difficulty of keeping track of the goods in process increase with the size of the mill and number of styles in the lines. Orders varying from one to a hundred or more pieces each are distributed among five hundred or more styles, with deliveries specified for different dates covering a period of several months. A dozen or more fabrics requiring many different kinds of yarn of widely varying sizes and materials may be included in the five hundred or more styles, some of which are dyed in the raw stock, some in the yarn and others in the piece. Some of the yarn may be bought while other grades may be spun at the mill.

As the orders are received at the mill the superintendent is confronted with the problem of how to start the many different kinds of stock through the mill in order that the machinery in each process, while working on batches of economical size, may deliver the materials to the succeeding departments so that they may be brought together without delay and the different styles dressed, woven and finished in the quantity and at the time specified on the order books.

This is an important and a difficult problem, requiring for its solution system and a constant oversight by those in charge of the work. A well-arranged order book lies at the basis of the solution of this problem, and Mr. Arnold describes the best one that we have yet seen. It must, of course, be modified to suit the requirements of each mill, but it is based on the right principles. The use of the loose leaf is excellent, enabling the styles to be arranged in consecutive order, regardless of the number of orders received, and any styles to be thrown out as soon as they are for any reason taken from the line.

The American Cotton Manufacturers at Philadelphia.

The board of governors of the American Cotton Manufacturers' Association has fixed upon Philadelphia as the place for the next annual meeting of that organization, to be held next spring. This selection is in line with the broadening scope of the association. Philadelphia is important in itself as a manufacturing centre and a convenient meeting place for both Southern and Northern visitors. It will doubtless attract a large number from both sections.

In line with the progressive spirit animating the "American" is the plan to have at the Philadelphia meeting an exhibition of machinery and processes connected with the textile industry. This will give an unequaled opportunity to machine builders and those

controlling improved textile processes to bring their lines to the attention of cotton manufacturers.

In view of the general desire to bring about closer working relations between planters and manufacturers the meeting at Philadelphia might well be utilized for that desirable end. Special conferences of growers and manufacturers, like that held at Washington last May, entail much labor and expense and while of great importance, nevertheless, are an additional burden on the trade. As American cotton manufacturers are to meet under the auspices of their own association, meeting the planters at the same time would be a distinct advantage. The planters might reply to this that this saving of time is one-sided and that for them the advantage could be effected only by bringing the manufacturers to the meetings of the growers. This also is a good suggestion. Let the conferences of growers and manufacturers, which the trade on both sides of the Atlantic so earnestly desires to promote, be arranged at the regular meetings of the planters and manufacturers respectively.

Englishmen to Raise American Cotton.

A sequel to the Washington Cotton Conference and the visit of the Lancashire manufacturers to this country last spring is the proposed investment of Lancashire capital in the raising of American cotton. We are informed that two Lancashire manufacturers will arrive in the United States within a few weeks and complete arrangements for the purchase and management of a large cotton plantation in the South, probably in Texas. There is said to be ample capital back of the enterprise. The plan is to adopt the most improved methods of cultivation, ginning and baling, and ship the cotton direct to the Lancashire mills controlled by the promoters.

It is to be hoped this venture by English manufacturers will be entirely successful. Its success will mean much for the cotton trade. We have had a surfeit of precept as to the evils that oppress the cotton trade, and their remedies,—all to no purpose. The evils have grown greater and those responsible for them have treated all protests with contempt. What we need now is an example. The example of a large plantation in the South producing cotton properly baled and shipped to Lancashire and there received in good order at the mills would mark the beginning of the end of the present disgraceful methods of baling American cotton. The existing combine of ginners that blocks all attempts by planters and manufacturers to improve conditions might for a time resist even the influence of a good example, but eventually they would be forced to adopt the improved processes. It may be safely assumed that the present methods of preparing cotton for market cannot exist permanently alongside of right methods. The former have continued because all American cotton has been and is baled in an equally bad way.

The influence of such a plantation on the other evils that afflict the cotton trade are not equally evident. There is no doubt, however, but that such influence would be entirely for good. A large and well-managed cotton plantation, owned by cotton manufacturers, producing cotton for the mills of its owners, forming a component part of one complete industry, might not eliminate the speculator from the cotton market; but it could not fail to indicate to the manufacturer a refuge from the speculator's attacks.

Germany Denies the Most Favored Nation Clause to the United States.

What may prove to be the first step in a tariff war with the United States has at last been taken by Germany. When the new and much higher German tariff went into effect early in the current year the Reichstag, at the request of the imperial government, passed a special act giving gratis to the United States the advantage of the minimum rates granted to seven European countries that had previously obtained this advantage by granting material tariff reductions on goods imported from Germany.

This action, indicating as it did so clearly the German fear of a tariff war with the United States, was a bitter dose for Germany to swallow, and it is not surprising that steps have been taken to correct what they consider a glaring inequality. A few months

ago a commercial treaty with Sweden was concluded by Germany, granting the minimum rates on certain products from Sweden that were not included in the treaties with the seven countries already referred to. Among these are woodenware, rubber shoes and pyroxylic spirits. The question then arose as to whether the United States, under the special German act of Feb. 26, was entitled to the additional favors granted to Sweden. A decision on this point has recently been made by the German government to the effect that the United States is entitled only to the reduced rates granted to the seven countries named in the act of Feb. 26, and only during the life of the existing treaties with those countries. In this decision Germany states specifically that the United States is not entitled to the advantages of the most favored nation clause, but that the minimum rates granted to us are limited strictly to the time and the commodities covered by the law of Feb. 26. This interpretation puts an altogether different face on the commercial relations between the United States and Germany, and leaves the latter country practically free to discriminate against American goods. It remains to be seen how the government at Washington will meet the new conditions.

Mill Life in the South.

Southern mill life has been the subject of interminable discussion in daily newspapers and magazines. Northern writers have caught a glimpse of Southern mills and straightway rushed into print, as if they knew their subject, mixing denunciation and faint praise, and proposing easy solutions for the most difficult social problems. The Southern textile industry has received special notice from these amateur reformers. For this reason a calm statement of the actual conditions is peculiarly welcome. This we are able to present in the form of the following extract from a private letter, written by a Southern mill superintendent without any idea at the time that it would appear in print. Born in Europe he has made the South his home for several years, expects to stay there, and is free from any prejudice that might attach to prolonged residence in the North:

Of course my knowledge of Southern mill help extends only to this State, but undoubtedly it will hold good for the whole South. The trouble with the Northern people when they write about Southern mill help is that they don't take into consideration the people that make up the mill help. They don't see that a large part of the population known as the "poor whites" is just as listless as the mill help. It is not the mill that makes them so. No, sir. They are so already. Poor, ignorant, listless, slow, with apparently no ambition. Go in the mountain-sections of this State and you will find the men, women and children just the same as you find them in the mills. The same in the lowlands of the East, where if anything they are worse.

Who are the mill hands in the Southern mills? The poor farmers and their families. Why do they give up farming? Because they can make a little ready money in the mills, which they can't make as easy on their little patch of ground. When farming seems to be paying, some of them go back to their little patches, but they miss the ready money they get at the end of the week in the mill, and usually come back in the mill to stay.

I will give you my explanation of the apparent ill health and listlessness of the Southern mill help. The climate is the first cause, poverty is another, wrong feeding is a strong third. It's the strangest thing to me how people in such a hot country can eat such greasy food, so-called sowbelly, cabbage and indigestible hot biscuits are their favorite dishes. The cereals are eaten with a lot of greasy gravy. Everything has to have grease on it. Is it strange that the people look sickly? This thing has been going on for generations, I suppose, and so they degenerate more and more.

They are illiterate. How can it be otherwise? The mill owners are certainly not to be blamed for that. It's only in the last few years that prominent educators have been trying to raise the standard of schooling by spouting in every little village all over the State so as to get the people to see the necessity of better schoolhouses and more than three months of schooling in the year. If people are truthful they must acknowledge that the mill owner is doing a heap in this respect. We have in this town, for example, two cotton mills within a mile of each other, and each supports its own graded school at considerable expense. The same in other places. Not long ago I was in a mill in one of the largest towns in the State. A little boy came in with a note from one of the teachers of the mill owner's school, saying that the little fellow knew the ten commandments. The proprietor of the mill gave the little chap a nice Bible for his efficiency. So you see how even religion is fostered by the cotton manufacturers. I know that our people here spend a good deal towards the upkeep of several churches.

Now as to the mill villages. It is certainly true that the average cotton mill village is not exactly a thing of beauty, but what can you expect? You cannot request the mill owner to build stone fronts for his mill people. They are not accustomed to anything much better than they are getting. At our new mills, you can find a certain difference in the style of the buildings and the

houses are also painted differently. The owners of our mills here offer every year prizes for the best kept yards. Is not that pretty good? The wages of course are not as high down here as up North, but I think, and you know that, too, that you can get more out of Northern help than you can get out of the help down here. Moreover, no business man under the sun pays any higher wages than he has to. Besides, wages are going up down here, too.

The employment of children is another favorite subject of these Northern critics, but that will remedy itself as the people advance. As for the mill owner, what is he going to do? He must keep his machinery going the best he can. Help is mighty scarce and it is getting scarcer right along. It's among mill men a well known fact that children do not supply the cheapest labor, but we must take what we can get. Besides the parents of these children are to be blamed. As I have said before, this will remedy itself as the people advance and see the necessity of a compulsory school law to keep children in school up to the age of fourteen. I have seen men down here on machines where up North children would have been employed. The men gave better satisfaction, too.

The International Cotton Federation.

An echo of the cotton congress held at Bremen last June is found in a circular issued by the French Cotton Manufacturers' Association. In the introduction we find this statement:

"In accordance with the resolution adopted (by the Bremen Congress) on June 26, the questions proposed by Messrs. Macalister of England, de Hemptine of Belgium, and others, will be taken under immediate consideration with the support of J. R. MacColl, president of the New England Cotton Manufacturers' Association, which has given its adherence to the Cotton Federation of the continent."

The French Cotton Manufacturers' Association is evidently mistaken. We are informed by the secretary of the National Association of Cotton Manufacturers (formerly the New England) that that association has not given its adherence to the International Federation. Moreover, because of the character of its work as specified in its charter, it could not join in the work of the Federation even if its members wanted to. As the representative of the New England Association at the Manchester Congress last year left no chance for the supposition that the American association intended to join the Federation, the error of the French association must have grown out of the visit of a New England representative to the Bremen Congress this year. That visit, however, like the one to Manchester last year, was made, as far as we can determine, simply for the purpose of indicating the friendly attitude of the American trade toward the European cotton manufacturers and our disposition to co-operate with them on such lines of work as might be for the common interest of Americans and Europeans. The objects of the European Federation are well known, and it is a clearly recognized fact on this side of the Atlantic that the main object of that Federation is to protect special interests of the European trade, in which Americans have practically nothing in common.

There are, however, many important questions, of which a solution is for the interests alike of the American cotton planter, the American manufacturer and the European manufacturer. In the solution of this latter class of problems and in these only are American cotton planters and manufacturers ready to co-operate with the European Federation. Any co-operation between the American and European cotton trades necessitates a clear distinction between what we will do and what we will not do. For this reason it is very desirable that the mistake made by the French Cotton Association be promptly corrected.

A Bleaching Combine.

Seventeen Austrian bleachers and finishers of cotton goods, with a yearly capacity of 165,000,000 yards, have recently combined under what is called a cartel to protect their business against the abuses and unfavorable conditions existing at the present time. A less stringent agreement has been in force among the Austrian bleaching and finishing firms since 1890, but has proved insufficient to keep the industry on a paying basis. During the last fifteen years conditions have grown steadily worse. The managers of the new combine state that all industries supplying bleaching and finishing materials have been brought under the operation of cartels, causing a material increase in the cost of these supplies. Among these the starch trust is noteworthy. The price of coal at the present time is 50 per cent. higher than in 1890. Wages have advanced materially, and

insurance companies have combined to raise rates while the government has passed laws imposing more stringent regulations causing much expense.

Bleachers and finishers have been powerless to oppose these adverse influences. Under the circumstances an increase in the price of bleaching and finishing would be expected, but this has not been the case. Owing to the growing competition between the different firms and the condition of the cotton market the manufacturers have forced the bleachers to reduce prices from 15 to 25 per cent. The increase in the cost of bleaching and finishing and the reduction in the price have brought the business to a state where it is impossible to earn interest on the capital invested, while the profits to which the finisher and bleacher are clearly entitled is wholly out of the question. With ruin staring the bleachers in the face they have now combined to raise prices not for the purpose of making an easy profit possible, but in order to prevent bankruptcy. The new cartel went into effect on August 1 and was followed by an increase of one-eighth of a cent for bleaching goods of the ordinary width.

Approaching the Danger Point.

On Sept. 28 the stock of cotton of all kinds at Liverpool amounted to but 277,000 bales, which is estimated to be about four weeks' supply for the mills of Lancashire. Last year at the same date the Liverpool stock was estimated at 661,000 bales, or about ten weeks' supply. On the corresponding date in 1904, during the period of scarcity that forced the European mills to run on short time, Liverpool had 146,000 bales of cotton on hand. In view of the increase of spindles in Europe during the last two years the small size of the present stock affords grounds for uneasiness on the part of the European manufacturers and emphasizes their dependence on the crop now being gathered. In 1904 the European trade was saved by a record crop of 13,500,000 bales. A crop fully as large is needed to keep the mills on both sides of the Atlantic supplied with raw material during the coming year, as the Liverpool stock represents the condition of the visible stock throughout the world. The total stock in all markets on Sept. 29 was estimated at 1,970,746 bales, as compared with 2,298,939 bales in 1905, and 1,828,211 bales in 1904.

Textile Trademarks in China.

The value of established trademarks is nowhere better illustrated than in China, where the use of symbols is carried to an extreme that to us seems ridiculous. The Chinese written language has no letters, as we understand them, but consists of an indefinite number of symbols or signs representing ideas. This symbolic method of expression is an ingrained habit among the Chinese. As a consequence the trademarks on cotton goods obtain an exaggerated importance in the Chinese mind.

This was recently illustrated by the experience of a New England mill that had for years exported large quantities of goods to China under a trademark that bore the figure of a rooster. Some time ago the old stamp used for marking the goods became so badly worn that a new one was ordered. In making the new stamp the rooster's tail was raised a little higher than it was on the old mark. This was considered a matter of no importance at the mill, but when the goods marked with the new stamp reached China, the Chinese noticed at once the difference in the height of the tails of the old and new roosters, and immediately concluded that it indicated a difference in the goods. They accordingly refused to accept the new goods and the New England mill was forced to allow a discount in order to sell the mechandise.

This peculiar attachment to symbols makes established trademarks almost essential in selling goods in China. Attempts have repeatedly been made to displace well-known brands of goods by offering the Chinese better fabrics at lower prices. All to no purpose. The Chinaman continued to buy the older and inferior goods at higher prices, simply because they bore the marks with which he was familiar.

English exporters are able to hold their Chinese trade through the control of established trademarks, which is assured to them

by the stringent English law. A recent case in the Chancery Court at Liverpool, illustrating this, is thus reported in the Guardian:

Messrs. Coddington and Lamb, white cotton shirting merchants, Manchester, sought an interim injunction to restrain Messrs. G. S. Mitchell & Co., cotton shirting merchants, Manchester, from passing off certain shirtings as the plaintiffs' goods, of which they were a colorable imitation, through stamping thereon a combination of marks known as the "Chinaman and Flag," marks which were used by the plaintiffs upon their goods. Mr. Grant was for the plaintiffs, who, he stated, had carried on business for 26 years in Manchester, and for the last 19 years had shipped large quantities of white cotton shirtings to Hong Kong, Manila, and other Eastern countries. In 1887 they invented a combination of marks known as the "Chinaman and Flag" marks, which was used exclusively by them on their exported goods.

They discovered recently that a combination similar to theirs was being put upon the market in Manila. A pattern was brought to England, and the plaintiffs, inquiring from the defendants' bleachers, Messrs. Buckley and Burnand, Limited, were informed that the stuff was treated for the defendants.

To make assurance doubly sure, the plaintiffs sent the offending pattern to Messrs. Buckley and Burnand, who gave the plaintiffs the information but detained the pattern, which they now produced in court in submission to a subpoena issued by the plaintiffs. The defendants admitted the pattern was their goods, but they said the stamp was not put on it by them but by somebody else. This pattern, although stamped 40 yards, consisted only of 35 yards.

Messrs. Buckley & Co., another firm of bleachers, who do work for the plaintiffs, also received a piece of cloth which the plaintiffs said was also an infringement of their marks, and that, too, was stamped 40 yards, although only 35 yards, and the information was that this cloth was stamped for the defendants. Mr. Grant put in the patterns of cloth referred to, and submitted that the evidence connected the defendants with the cloth and entitled him to an injunction.

Mr. Maberly, for defendants, contended the evidence did not connect them with any infringement or imitation, and an injunction should not issue.

The Vice Chancellor pointed out that defendants had not filed any affidavit in answer to the allegations of plaintiffs, and said that if the defendants were not connected in any way with the cloth produced an injunction could not hurt them.

Mr. Maberly: Your Honor is a judge, and will not go beyond the evidence.

His Honor: Well, I am a combination of judge and jury really.

Mr. Maberly said one of the patterns complained of was admittedly the defendants' goods, but they did not put the marks on. Exhibiting the cloths with the two designs—a picture of a Chinaman surrounded by what purported to be Chinese letters,—Mr. Maberly asked if his Honor thought there was any resemblance between them. In one case, he said, the letters represented the name of the plaintiffs and in the other the name of the defendants.

His Honor: Well, one may represent a Chinaman before the Sheffield election and the other after it. (Laughter.) One looks like a rejoicing Chinaman and the other like a Chinaman prepared to meet his fate. (Laughter.)

Mr. Maberly: One shows a Chinaman waving flags from a balloon in mid-air, and the other is a Chinese policeman standing soberly by the waterside. (Laughter.) Do you think anybody could mistake that for the plaintiffs' mark?

His Honor: I do not know. I think there is enough evidence uncontradicted to justify me in granting an interim injunction. I think the defendants would be wise not to repeat nor sell that pattern. The question of costs will be reserved till the action.

Established cotton trademarks are an important part of a mill's assets. They represent the good will of the buyers, something which is intangible, which cannot be weighed and measured as are the raw material and the finished goods, but which may be worth more to the manufacturer than his entire mill and machinery.

Insurance Against Loss of Employment.

Switzerland has taken the lead in developing insurance of work people against loss of employment. A recent issue of the German Imperial Labor Gazette (Reichsarbeitblatt) contains an account of the development of this system of insurance, from which it appears there are different forms at present in operation. Under the compulsory system established by the Swiss government at Basle the insured are divided into two classes, factory employes and building trades operatives. The premiums paid by the insured are graded according to the wages earned. The employers pay two cents weekly for each factory employe, and four cents for each employe in the building trades. The insured is entitled to draw an allowance from the insurance company only when out of work under certain conditions. No claim is allowed under the following conditions:

1. Loss of work through strikes and lockouts.
2. Voluntary giving up of work.
3. Certain conduct of the insured.
4. Sickness and accident.
5. Refusal to accept work without good reasons.

These exceptions are designed to limit the payment of relief to those cases where the insured is willing and able to work, but is unable to find employment.

The Baling of American Cotton.

Some time ago it occurred to us that an account of the condition in which American and Indian cotton reached Japan and of the manner in which it was handled by the Japanese, might be useful in again calling the

FIG. 1. MUSHROOMS GROWING ON AMERICAN COTTON IN JAPAN.

attention of the trade to the abuses in baling American cotton and indicating how baling should be done. We accordingly addressed a number of letters of enquiry to

FIG. 2. AMERICAN COTTON IN JAPAN.

Japan, their tenor being indicated by the following sent to Consul Miller, formerly stationed at Newchwang, whose efficient work at that place is well known:

Hon. H. B. Miller, American Consul-General, Yokohama, Japan.

Dear Sir:—I beg leave to suggest that you send to the State Department a report on the condition in which American cotton reaches Japan. As you probably know, American cotton is baled in the United States in a very bad way and reaches Europe in a condition that causes loss to both shipper and manufacturer. It occurs to me that it might help along the movement to reform our methods of baling to have a report on the condition of the cotton when it reaches Japan, illustrating it with photographs if possible.

Under another cover I am sending you a copy of our magazine containing a report by Consul General Skinner at Marseilles, in which he shows how well Indian cotton is baled.

Your former reports from Newchwang convince me that if you act on this suggestion we will have a report of great value to the cotton trade.

The first response to our enquiries was a letter from the agent of the Pacific Mail Steamship Company at Kobe, in which he pictured the difficulties and lack of landing facilities from which the cotton trade at that port suffered. This letter appeared in our June issue, but owing to its bearing on what is to follow we insert it here:

Kobe, April 18, 1906.

Editor Textile World Record:

The cotton season during the last year was the worst the importers of this district ever experienced, the losses being enormous. This was due to the lack of landing facilities at Kobe, the unprecedently bad weather, and the shockingly poor manner in which bales of cotton were marked. It was also difficult for consignees to take delivery of cargo on account of thousands of coolies as well as hundreds of lighters having been commandeered for the war, the shortage of lighters making it impossible to carry cotton from the landing place to the mills. The consignees fought the steamship companies, alleging that they had no right to land cotton in the open, no right to put cotton where they could not take delivery, and in fact, declared that the companies had no right to import cotton if the consignees could not immediately obtain delivery. The steamship companies, however, were fortunate in paying only for differences in grades and actual shortage of cotton, although they were threatened with claims for hundreds of thousands of dollars.

The two photographs herewith were taken at the Minatogawa customs compound. Fig. 1 shows a bale of cotton with mushrooms growing from it, also a considerable number of bales lying in the open in the most deplorable condition. Fig. 2 is another view of cotton lying in the open and exposed to all kinds of weather.

W. W. Campbell, Agent,
Pacific Mail Steamship Co.

It is difficult to imagine worse conditions in the baling, transportation and handling of cotton than are here described. The dis-

credit attaches alike to the American and Japanese, but the second response to our enquiries, which has recently been received from the American consul at Kobe indicates that the Japanese have taken measures to remedy the difficulty as far as is possible for them. This letter, which follows, shows plainly how far Americans are behind the Asiatics in the baling of cotton for the market:

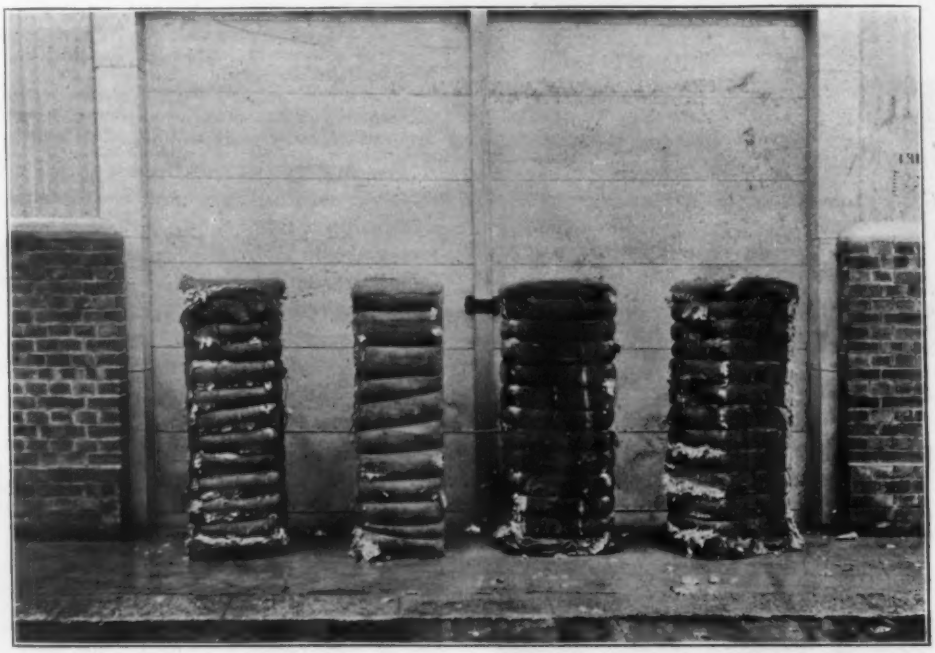


FIG. 3. INDIAN COTTON AS RECEIVED IN JAPAN.

American Consulate,
Kobe, Japan, Aug. 17, 1906.

Editor Textile World Record:

Your letter of June 2, 1906, to the consul-general at Yokohama, asking for a report on the condition in which American cotton reaches Japan, illustrated with photographs if possible, has been forwarded by him to this consulate for reply.

Accordingly I have had some photographs taken, which I beg to transmit under separate cover.

BOMBAY COTTON.

This cotton, Fig. 3, is the best packed of all that comes to this market. The bales are of a uniform weight of 400 pounds, and it is seldom necessary to weigh more than 10 out of every 100 when accepting delivery.

They are wrapped in a good quality of sacking and arrive without being torn or damaged, and the marks are plainly legible.

AMERICAN COTTON.

In strong contrast with the preceding is the condition in which cotton from the United States reaches this country, Fig. 4.

The sacking is a very coarse kind of gunny, which is easily torn in transit, and as there is no protection by sheds at the places of packing and trans-shipment, the cotton generally receives much damage from the weather. As a consequence, the marks are always indistinct and are frequently entirely obliterated.

Another point which militates against American cotton is the great variation in the weight of the bales. Uniformity in this respect is very desirable, as it greatly facilitates the estimating of space required for storing and lightering.

Figs. 5 and 6 show the interior and exterior of one of the sheds which have been erected at this port for the storage and handling of cotton by the Tokyo Warehouse Co., in conjunction with the dealers in cotton.

This company has three sheds with a ground floor space of 3,136 tsubo (111,592 square feet), erected at a cost of $74,700, two brick warehouses

FIG. 4. AMERICAN COTTON AS RECEIVED IN JAPAN.

FIG. 5. INTERIOR OF COTTON WAREHOUSE AT KOBE, JAPAN.

covering 1,152 tsubo (40,993 square feet), costing $41,832, two piers for lighters, each 36 feet by 72 feet, and has also built two and a half miles of railroad track in the compound.

Respectfully,
Hunter Sharp, American Consul.

Further comment on these reports from Japan is superfluous. The question arises, How long will it be before efficient measures are adopted in the United States to bale American cotton properly?

FIG. 6. EXTERIOR OF COTTON WAREHOUSE AT KOBE, JAPAN.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

There is no perceptible improvement in the demand; operations are of the most meagre character, sample pieces only being in request. The majority of agents are, however, optimistic and express their belief that the present month will make up for the quiet period experienced. Their opinion is largely based upon the prevailing prosperous condition in almost every other line, and they point to the fact that the clothiers are feeling the pulse of the trade previous to placing their fall orders, with the result that inactivity is to be expected between initial purchases and the time for receiving duplicates.

There is every reason for the belief that the normal volume of business will be accomplished between now and the first of the new year.

No marked change in the request for the different fabrics has taken place. Worsted finishes are apparently as strong as at the opening period. It was predicted by some that cheviot and woolen would gain strength as the season advanced, but there is no present indication of the correctness of that view. The same complaints are heard about the wearing qualities of the so-called mercerized worsteds, but such fabrics prove to be the leaders in the demand.

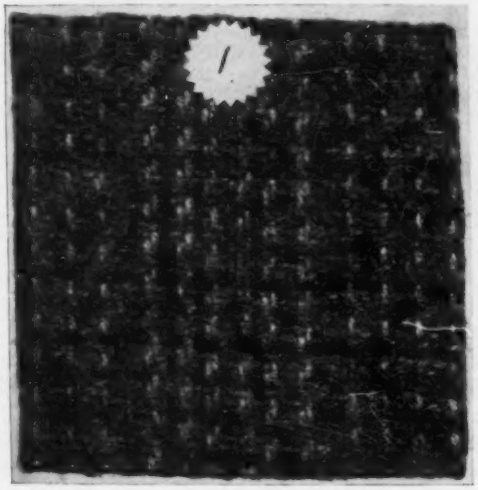
Reorders from the clothiers for heavy weight meltons and friezes are becoming more frequent for immediate delivery, and probably will be augmented as the cold weather approaches.

DRESS GOODS.

The dress goods division of the market is in a flourishing condition, and the volume of business is so distributed that there are no complaints heard from either the importers or the domestic manufacturers.

While it is generally admitted that the leading fabric is the broadcloth finish in plain colors as well as the ombre plaids and other unobtrusive subdued effects, the call for fancies is continuous. Grey overchecks and grey broken plaids in the panama weave are in high favor.

Dark diagonal twill mixtures are meeting with ready sale, more especially in such combinations as dark greys, hunters' green and



browns. F. A. Boehman of L. Dommerich & Company are showing an extensive line of such fabrics 50 inches wide at 87 1/2 cents.

Silk and wool batistes and eolines are in favor for evening wear. The request is principally for the plain goods, but such fabrics are shown in small stripes and checks in all the leading colors.

Fancy voiles in a variety of designs are among the new novelties shown for spring. For immediate consumption large handsome plaids are some of the novelties shown. There is every indication that there will be a revival of the silk and wool poplins. Serges are also one of the staples in continual request.

Tourist overcoatings are largely used for automobile coats and cape purposes and are principally absorbed by the cutters.

Fig. 1 is a 50-inch cloth at $1.00 by F. A. Boehman.

SILKS.

The situation is very much improved and just at present there is considerable activity. There is manifested a pronounced demand for plaids suitable for dressy waist purposes; desirable styles are hard to secure for spot delivery.

Manufacturers are showing their spring lines of Roman stripes, but no particular effort is made to force the market. It is thought that the run on plaids will be of comparatively short duration, and these Roman stripes will then be pushed forward to take their place. Figs. 2 and 3 illustrate two styles of peculiarly beautiful combinations shown by Jonsen & Pretzfeld, 20 inches wide at 70 cents. Novelties of this character are produced only by four or five mills in this country, notably Dexter Lambert & Company, Pelgram & Meyer, Valentine & Bently, Jansen & Pretzfeld and two or three others that produce a lower grade.

Next in the order of novelties are the coin spot designs on principally satin foulard grounds, white on black ground being the most popular. Cheney Bros.' productions are generally considered leaders on fabrics of this order. Taffetas still constitute the bulk of silk business, and on the whole, may be considered a staple, especially blackboard taffetas; apparently the demand is on the increase.

Peau de cygnes and messalines are taken in fair quantities for a variety of purposes. Printed chiffons and printed gauzes are shown in a variety of beautiful designs for evening wear. Pompadour taffetas are shown in an endless variety for the same purpose. Radiums and crepe de chines show diminution in the request as the fall season progresses.

COTTONS.

A hardening tendency is noted in the cotton market, and some buyers who have procrastinated with their orders are confronted with the fact that there will be a delay in the shipments of a number of lines, such as wide

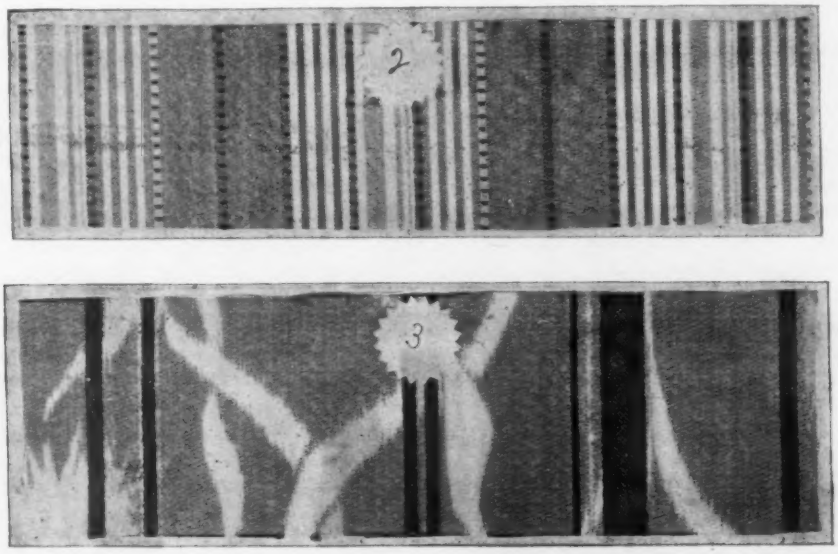
sheetings, denims, ducks, staple and dress ginghams, and other cotton fabrics.

There is a dearth of napped goods, such as outing flannels, several tickets being completely out of the market. Sheer goods such as India linons and Victoria lawns are said to be oversold. Difficulty is experienced in securing sheets and pillow cases within less than six weeks to two months.

The whole production of the mills producing such staple dress ginghams as Toile du Nord, A. F. C., Red Seal and Everett classes, are absorbed within a few days after the opening.

The jobber's quotations on these fabrics are as follows: Toile du Nord, 9 1/2 cents net; A. F. C., 9 cents less 5 per cent. and 2 1/2 per cent.; red seal, 9 cents less 5 per cent. and 2 1/2 per cent.

Although prints are selling well and no complaints forthcoming, there does not appear to be any scarcity; prices are firm and no concessions can be had.



Questions from the Texas Cotton Fields.

A LANCASHIRE REPLY.

Royal Exchange, Manchester, Eng.,
Sept. 26, 1906.

Editor Textile World Record:

The letters from Mr. A. P. Landers in the August and September issues of the Textile World Record, read alongside the address given by Mr. Harvie Jordan at the Hotel Champlain meeting of the National Association of Cotton Manufacturers, give great encouragement to those who are interested in the present great movement in the South, to improve the conditions under which cotton is grown, ginned, baled and marketed.

The question of ginning and baling may well be left in the hands of the planters' and farmers' associations, for they know from the Washington Conference what is desired. The marketing of cotton, however, is a matter in which it will be well for the planter to carefully consider his customers' requirements and prejudices. Such tall talk as America "controlling" cotton raw and manufactured and the remarks about "manoeuvres" of officials of the International Federation of Cotton Spinners to depress cotton prices, do not tend to a better understanding with European spinners. Just as the European spinner is largely dependent on

the Southern planter for his supply, so is the Southern planter dependent on the spinners of all countries to take his crop.

The International Federation was formed through the action of manipulators of futures in Liverpool, New Orleans and New York, having put cotton up to such a price in the spring of 1904 that trade was practically impossible. It was undoubtedly proved that the only weapon in the hands of spinners was "short time" and Lancashire undoubtedly by her unselfish and timely action saved the trade from disaster. Yet, in spite of this fact, at the Congresses of Zurich, Manchester and Bremen there was neither discussion nor action taken to encourage the idea of short time. Instead, all papers and discussions have been on cotton growing, cotton reserves and stable prices. The International Federation is well disposed toward the Southern Cotton Association and is deeply interested in the question of warehouses and direct trading.

The fixing of prices by the cotton growers' conventions of January, 1905 and 1906, has undoubtedly proved a means of steadying prices (although the 12 cents of January, 1906, really should have read 10 cents), and it will be interesting to watch the effect on prices of the fixing of 15 cents at the September convention.

To all the efforts made to arrive at more stable prices, there is the enemy waiting at the gate, exacting toll from both grower and spinner and holding both in a state of fear that at any opportunity arising, the one or the other may be attacked, which ever may appear to be the weaker.

Not till spinners and planters free themselves from the power of the "futures markets" can stable prices be relied upon. Not till we return to the methods of 50 years ago and buy and sell at a price, instead of "points on" our "hedges" or "covers," will direct trading be possible in any volume. Let planters and spinners learn to know each other and they will find that their interests are mutual and that

They are jolly good fellows
Which nobody can deny.

Canada will give 160 acres of land free to every adult applicant.

ALLOWING FOR DEPRECIATION IN ENGLISH MILLS.

Provision for the depreciation of mill plants is a matter on which there is always some variation of practice and opinion. Directors of companies who have more eyes for the share-market than for the mill, and managers of municipal undertakings, are found arguing that of charging off for depreciation there need be little or none, if only the equipment is maintained in a high state of efficiency out of revenue. That contention may suit the case of those who have to put the best face on a somewhat precarious condition. It is not a doctrine that appeals to men who feel that the balance sheet should always be a little better than it looks. Unfortunate contingencies—though they cannot be foreseen—may always be indefinitely expected. And the manufacturer whose own money is at stake wants to feel that at least he is not behind his fellows in prudent estimation of his own assets.

To place his affairs reliably on paper the manufacturer must maintain his plant at the cost of revenue and must periodically reduce the capital value of the plant, as it stands in the books, by an amount appropriate to his own circumstances. The provision for depreciation ought evidently to be largest in the case of plants that are liable to be superseded at any time by some more modern invention. It may be relatively small where trade conditions are stable and where a free market for second-hand machinery exists. Generally, in the textile trades, affairs may be regarded as settled. A world-shaking revolution that would reduce profits on all processes carried on with existing plant is not so probable that it cannot be ensured against at a moderate premium. But we have to provide against such an eventuality. We have not to regard depreciation as entirely a matter of wear and tear. Improvements in some department are always forthcoming slowly and the argument for under-valuation as against that for over-valuation is overwhelming.

One's inclination then must be to depreciate liberally and the preliminary to doing so

is to ascertain what the lowest advisable rate is. Experience is the best guide to that and few men can claim a more intimate knowledge of textile manufacturers' books than G. P. Norton of the accountancy firm of Armitage & Norton of Huddersfield (Eng.). That authority points out the essential distinction between premises and plant, and he inclines to the practice of reckoning together premises and motive-power and appliances for purposes of depreciation. Much is to be said favorable to taking together all that which constitutes an eligible mill apart from the machinery upon its floors. Doing so, he suggests that premises and motive plant should be written down annually at a rate of from 3 1/2 to 6 per cent. Motive plant if estimated separately is reduced annually by some 5 to 7 per cent.

The English custom is to strike off between 2 1/2 and 5 per cent. from the mill alone and from 2 1/2 to 4 per cent. from any warehouses, offices or cottages that go with it. Land and buildings are always subject to local influences of an external sort, which enhance or reduce their value and these can be estimated only by independent valuation by skilled real estate men. Hence it is that the depreciation of premises is not solely proportional, but is complicated by movements of land-value and by any building additions during the year. These figures contemplate substantial stone or brick structures in districts in which textile manufacturing is something like indigenous. Were the building not likely to be permanent or to find a second tenant the allowances would call for some increase.

Depreciation of loose plant may be made in more ways than by an overhead deduction from the gross value. For example, the machines may be numbered and from each of them annually may be deducted a suitable sum, the aggregate deduction being then made from the whole. One reason for pursuing that practice is that an inventory is at hand in case of partial destruction of the factory by fire. It is, however, by charging a percentage on the diminishing value of the whole that English mills ordinarily proceed. Ten per cent. is a fairly safe average over a whole mill in which diverse processes are carried on. If it is exceeded in cases it is commonly undershot, and Mr. Norton furnishes details of a differential rating that has been found adequate in a great many cases.

Looms are the machines most subject to drastic depreciation and as they are speeded up they may come to require more than the standard 10 per cent. Furniture and fixings, according to their nature, are rated between 7 1/2 and 10 per cent. Combing and spinning plants, whether woolen, worsted, silk or cotton, are written down 7 1/2 per cent. and dyeing and finishing machinery 5 per cent. Carding apparatus allows of a further discrimination. Carding machines of sound construction and material are subjected to 5 per cent. and their clothing is estimated separately. Users are well informed as to the longevity of their own cards, but between one-fifth and one-seventh is reckoned off their value annually in England.

Such are some allowances that have gained the sanction of usage.

A LINEN WEAVING MILL.

Figs. 1 to 8 show the plant of a medium-size linen weaving mill built by Holzner Brothers of Hronov. The arrangement of the buildings is such that an enlargement of the works can be made without difficulty, as shown by Fig. 8.

The mill is divided into four parts. At the left is the warp preparing room, extending across the whole width of the mill. Then comes the weave room, next to this the belt-way, and then the wing. At the extreme right are the boilers and power station, as well as a small repair shop.

The front side of the mill is distinguished by the corridor, A. An enlargement of the mill must be made in the other direction, in which case the toilet rooms, I, would have to be moved. Aside from this the warp preparing room, the weave room and the belt-way can be extended without difficulty.

The entrance to the mill is through the vestibule, A, from which doors lead to the warp preparing and weave rooms. The warp preparing room, B, contains all the warp preparing machinery, together with the warp

Fig 1.

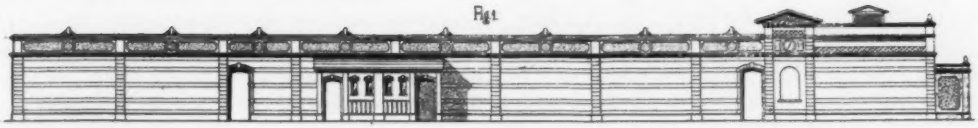


Fig 2.

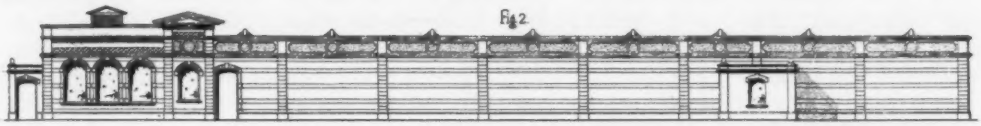


Fig 3.

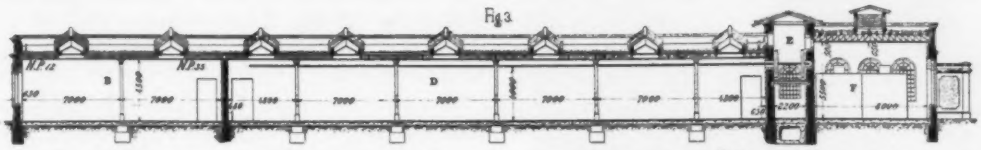


Fig 4.

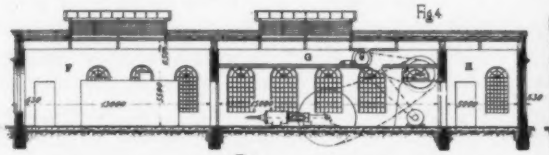


Fig 5.

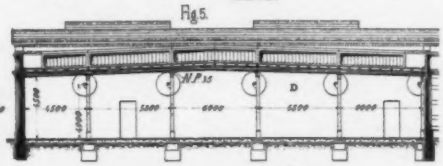


Fig 6.

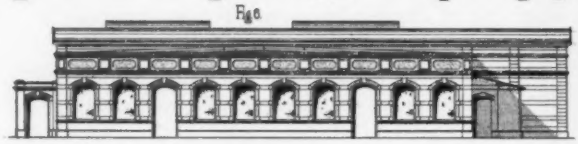


Fig 7.

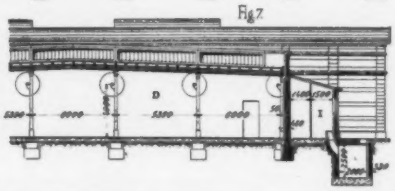
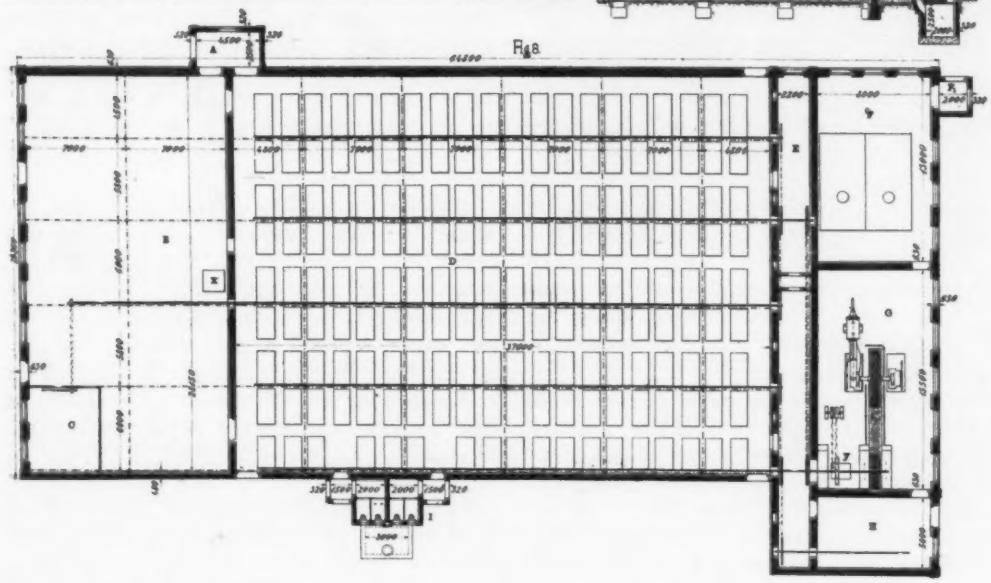


Fig 8.



drying and twisting apparatus. In this room the goods are examined, measured and folded. At the corner of the room the yarn is stored in racks, from which it is taken to be spooled on two warp and two filling spoolers of 160 spindles each.

In a separate room is found the skein yarn sizing apparatus. The warp spools are taken to the warpers, where the warps are beamed for the loom.

Half linen or cotton goods are steamed on a gig in the room, C, which is isolated by glass partitions to prevent the dust from spreading to the rest of the mill. The weave room contains 9 rows of 20 looms each. Two looms are left out of the first row in order to leave an entrance to the toilet rooms. The total number of looms is 178, 48 inches wide.

Lengthwise of the room, D, the spaces between the posts are 16 feet, 13 feet 7 inches, and 16 feet. Crosswise the spaces are 19 feet 6 inches, 19 feet, 19 feet 6 inches, 19 feet, and 14 feet 6 inches. The weave room is 122 feet long, 91 feet 6 inches wide, giving an area of 11,163 square feet. This is equal to 62 3/4 square feet per loom, which is a very economical result. The weave room is 14 feet 6 inches high, giving a capacity of 161,864 cu. ft., exclusive of the space in the monitor roof. Allowing 80 people in the weave room this gives 2,023 cu. ft. for each person. As in many countries the legal allowance is placed at 1,780 cu, ft., the result in this mill is especially favorable.

The looms are driven by half turn belts, an arrangement which is constantly growing in popularity. The chief advantage is economy in belting. Under ordinary conditions eleven belts running across the mill would be necessary, but with the arrangement shown in Fig. 8 only five belts, although somewhat longer, are required.

The distribution of the power is effected in the beltway. The beltway is of the ordinary construction and divided into two parts, as shown in Fig. 3, the upper floor enabling the bearings to be reached easily by the oilers. The lower floor is used as a storeroom. The plan shows the arrangement of the power transmission ropes so clearly that no further explanation is required. Each shaft has at the end a clutch which is operated from the weave room. In the wing to the right are the ventilator, F^1, the boiler-house, F, the power-house, G, and the repair shop, H. The engine has a capacity of 150 h. p. The plan shows only the high pressure cylinder, but the foundation is shown for the complete engine. From the fly wheel run eight power transmission ropes, each adapted for transmitting 60 h. p. to the main shafting which rests in bearings supported by solid masonry.

Near the left pier and in front of the wall separating the power-house and beltway is a pulley for driving the dynamo.

Figs. 3 and 5 show the general construction of the mill.

The roof windows extend over nearly the entire width of the mill and run parallel with the loom shafts. The room is made of wood and iron covered with wood cement.

Figs. 1, 2 and 6 show the front and sides of the mill.—Uhlands Technische Rundschau.

EXPOSITION AT BORDEAUX.

An International Maritime Exposition in celebration of a century of steam navigation will be held at Bordeaux, France, from May 1st to November 1st, 1907. This exposition is under the auspices of the French Maritime League and will have the official patronage of the French Government. It will be open to all countries and all products exhibited will be exempt from verification, custom house and octroi taxes.

Among the various groups of exhibits are some of textile interest, such as "Materials for Construction." This will contain such products as cordage, cables, ropes, canvas awnings, tarpaulins, duck, tissues, linens, laces, tapestries, etc. Henry G. Bayer, 47 Barclay St., New York, is the special commissioner for the American section and can furnish information to intending exhibitors.

Last year (1905) Japan imported coal-tar dyes to the value of $831,000, as against $520,000 and $700,000 in 1904 and 1903 respectively. Germany does the bulk of this trade; the share of Switzerland, which comes second, amounts to only $82,000.

DISTINGUISHING LINEN FROM COTTON.

BY ALOIS HERZOG.
(Translated from the German.)

INTRODUCTION.

During my experience in the linen industry I had very favorable opportunity to observe the great technical and commercial importance of the difference between flax and cotton. Unfortunately very few understand what the distinctions between the two fibres are and as a consequence there is much uncertainty regarding the character of fabrics of unknown origin or those made of cotton and finished to resemble linen. In the following article I have explained the most important differences between cotton and linen by which one can in a very short time without complicated apparatus distinguish one fibre from the other. In addition to these methods there are given the scientific and indispensable microscopical tests. An important feature of this article is the original photographs which enable the most inexperienced to recognize the characteristics of linen and cotton.

PHYSICAL AND CHEMICAL CHARACTERISTICS OF LINEN AND COTTON.

In view of the wide difference in price between bleached linen and cotton goods it is not surprising that from early times simple methods for distinguishing these two materials have been based on the physical and chemical distinctions between them. Although many of these tests involve a wide margin of uncertainty, and consequently do not give accurate results, it cannot be denied that some of them as, for example, the "oil test," in experienced hands gives very good results. While for accurate work scientific tests are alone to be considered standard, yet in the case under consideration, it would be going too far to reject various physical and chemical variations between cotton and linen; they give very good results with a minimum of time and application. The technical chemist would, on similar grounds, be compelled to reject very useful tests, such as blow pipe tests, color reactions for oil, breaking test for metal, etc., although these tests are very valuable in the laboratory and workshop. The tests for cotton and linen which follow must be considered as workshop tests. Many of them, the oil test for example, are of great importance to the microscopists, as when both cotton and linen threads are present in the warp of a fabric. In such a case it would be a very tedious operation to examine each of the warp threads under the microscope. Experience teaches that it is sufficient to test under a microscope only those threads whose character remains doubtful when viewed under the magnifying glass.

FIG. 1.

1. Breaking test. As a general thing linen fabrics are more difficult to break than those made from cotton. The broken edge of linen shows threads that are long and irregular, the projecting fibres being parallel and lustrous. The broken edge of cotton cloth exhibits twisted threads, the fibres being uniform in length and dull in appearance, Fig. 1.

Practice will enable the operator to distinguish linen from cotton by the sound when the fabric is torn. Linen emits a shrill and cotton a dull sound. When a group of

FIG. 2.

threads is quickly broken the cotton threads twist around each other while the linen threads hang straight.

2. Untwisting test. Cotton threads when untwisted disclose a number of entangled fibres, while in linen yarn treated the same way the fibres are much nearer parallel, Fig. 2.

3. Through-lighting test. When a linen fabric is held between the light and the eyes of the observer, it appears to be striped; cotton cloth is uniform, Fig. 3.

4. Burning test. Burnt ends of linen threads after the flame is extinguished appear smooth and compact, while the fibres of cotton threads treated in the same way are spread out more or less in brush form, Fig. 4.

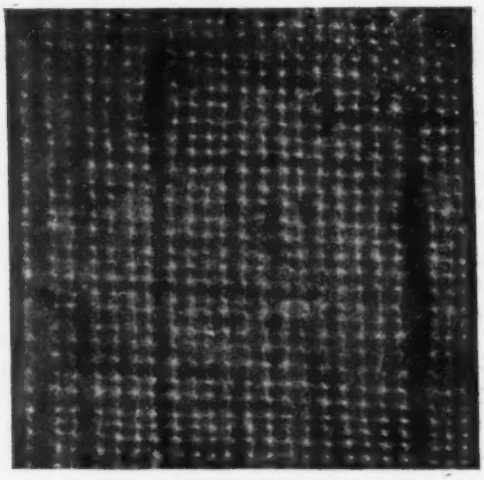


FIG. 3.

5. Oil test. The sample of cloth is boiled in water or alkali solution to remove the finishing material then laid on a glass plate and saturated with a heavy oil. A smaller glass plate is then placed over the sample to protect it from the air. After removing the surplus of oil from the edges, the sample is examined with the light falling on it and then with the light passing through it.

FIG. 4.

The linen fibre, owing to its thick cells with their greater resistance to light, appears transparent and resembles a spot of grease

on paper. When the light passes through it, it appears bright, and when the light falls upon it, it is dark.

The reverse is the case with cotton. The air in the interior of the cotton fibre as well

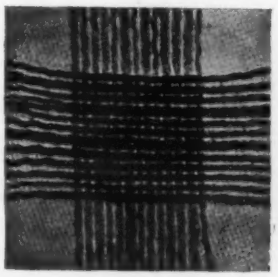


FIG. 5.

as between the fibres themselves is not displaced by the oil, and makes the cotton appear opaque; consequently when the light falls on the fibre, it is bright and when the light passes through it, it is dark, Figs. 5 and 6.

6. Sulphuric acid test. After having been freed from the finishing materials the sample of cloth is treated for one or two minutes in concentrated English sulphuric acid, then rinsed well in water and dried between blot-

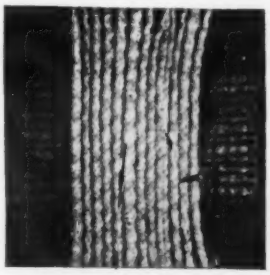


FIG. 6.

ting paper. Cotton is completely dissolved by this treatment; linen remains unaffected, Fig. 7. This test is suitable for colored goods, and by weighing the sample before and after treatment the quantity of each material can be approximated.

7. Color test. The older of the color tests are adapted for medium and coarse linen goods in which the fibre is found nearer its original condition than in fine goods. Flax and cotton retain the coloring materials in different degrees. The sample is treated in alcoholic solutions of madder and cochineal for about 15 minutes, the surplus of liquid then removed by blotting paper, and the sample examined in the partly dried condition. The results are as follows:

Madder tincture: Linen, orange; cotton, bright yellow.

Cochineal tincture: Linen, violet; cotton, bright red.

Neither this nor the fuchsine test is suitable for bleached or very fine fabrics. By the fuchsine test the sample is treated in a warm 1 degree alkali fuchsine solution, rinsed in water and then placed in concentrated ammonia for three minutes. This last

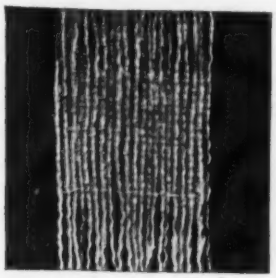


FIG. 7.

treatment strips the fuchsine color completely from the cotton, while flax fibre remains a rose color.

The methylene blue method is much better than the color test just given. The cloth is treated in a warm methylene blue solution, then rinsed well in water. Rinsing gradually removes the color from the cotton, but the linen fibre remains a bright blue. At an early stage of the process the cotton appears a greenish blue. This appearance is especially perceptible by lamplight. This test is adapted for all conditions of bleached fibres as it is based on the reaction of the fibres. The tests with saffronine and Bismarck brown do not give sharp contrasts and are, therefore, omitted here.

8. In conclusion it may be observed that linen cloth in consequence of its greater specific heat always feels cooler than cotton. Likewise the weight of linen and cotton cloth varies considerably owing to the different

structure of the fibres, linen being the heavier. Tests based on this characteristic require considerable experience and care. The so-called potash, steeping, ash test and other tests which are given in technical works are omitted as being without value.

9. Mercerized cotton is easily distinguished. The cotton fibre when treated

FIG. 11.

with an iodine solution of chloride of zinc is stained an intense blue. This stain is easily removed from ordinary cotton by rinsing in water while the mercerized fibre retains its color.

MICROSCOPIC TESTS.

The uncertain results of many of the tests to distinguish linen from cotton are due to the fact that both of these fibres consist of the same material,—cellulose. The investigator in distinguishing these fibres by sight is, consequently, forced to rely upon the characteristic adhesive substances which, in the case of bleached flax, consist of very small parts of the outside covering of the fibre, or upon the physical structure of the material. The structure of the fibre, owing to the extremely small size of the cells, can be observed only under the microscope. The distinctions between cotton and linen as seen under the microscope, are so constant and characteristic that an error in the diagnosis is out of the question. The microscopic

FIG. 12.

FIG. 13.

test is therefore of the greatest importance and should be employed where absolute certainty is desired. Owing to the very low price of microscopes the large buyers and sellers of goods will find the expense of a microscopic equipment to be soon repaid by the results obtained.

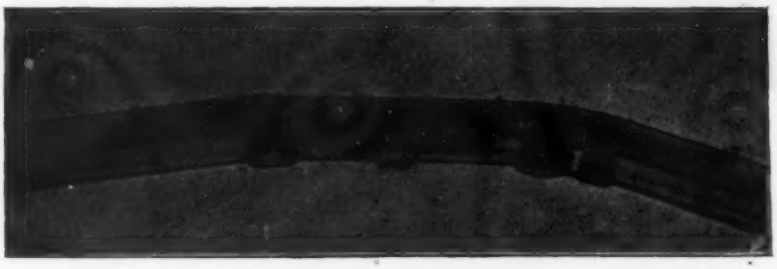


FIG. 14.

Cotton. Under the microscope cotton is seen to consist of flat bands, often twisted in spiral form and showing various irregulari-

ties of the raw fibre, Fig. 11. The reaction with ammoniacal oxide of copper is very characteristic of the cotton fibre. With a proper concentration of the solution according to the memoranda hereafter given, the

FIG. 15.

fibre first swells as shown at Fig. 16 and is then completely dissolved.

Linen. The appearance of the flax fibre under the microscope is very different from that of cotton. The flax fibres have thick walls and a pipe-like structure of great uniformity and thickness. Closer examination shows numerous coarse ridges and knots or bunches, being the so-called joints, Fig. 12. These are very evident when the fibre is im-

FIG. 16.

FIG. 17.

mersed in oil, Fig. 13. The inner space of the fibre which is enclosed on both sides by a sharply pointed tube appears in the form of a line when the fibre is held sideways.

On account of the albumen present an iodine preparation is well suited for testing the flax fibre, Fig. 14. The iodo chloride of zinc is the best solution. The albumen forms a brownish yellow shade while the cells are stained a reddish violet. Immersed in an ammoniacal solution of copper oxide the flax fibre is slowly dissolved, leaving an inner residue together with the albumen, Fig. 17. Other microscopic peculiarities, such as a cross section of the fibres, their appearance under polarized light, are of no importance for our present purpose and the reader is referred to special literature for information on this point.

Mercerized cotton. The fibre refracts light very strongly, is twisted slightly or not at all, is circular in form and has a sandy residue in the interior, Fig. 15. The color tests already given can be advantageously combined with the microscopical examination.

Following is a list of the necessary dyestuffs and solutions for the preceding tests. Those marked with a * had better be obtained from a dealer in chemical apparatus; the others, from a druggist:

1. Methylene blue.*
2. Fuchsine.*
3. Madder tincture. Extract of the madder root obtained by treating the root with alcohol.
4. Cochineal tincture.*
5. Olive oil.
6. Concentrated English sulphuric acid.
7. Ammonia.
8. Ammoniacal solution of copper oxide. Concentrated ammonia is poured over copper turnings and the mixture shaken frequently for half an hour (easily soluble).
9. Iodo chloride of zinc solution.*—

The number of cotton gins in operation in the United States in 1902 was 30,948, and the aggregate weight of cotton ginned was 5,315,472,700 pounds.

Labrador has a resident population of 10,000, composed of whites, Indian half-breeds and Esquimaux, yet it has no court nor jail, magistrate nor policeman, and has had but one criminal charge in fifty years.

CELLULAR FABRICS.

BY OPENTEX.

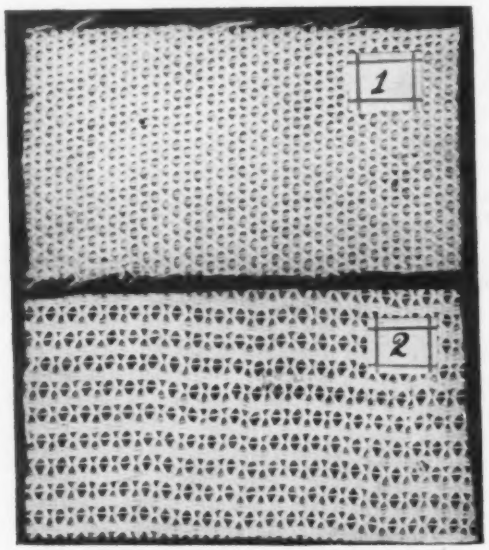
Cellular cloth, as its name implies, is an open, porous fabric of cell-like structure. From a hygienic point of view, fabrics of this kind when intended to be used for underclothing, summer shirtings, etc., are to be highly recommended because, being porous, they allow a free access of air to the body and, to use the words of an advertisement of a well-known make of this kind of cloth, "allow the skin to breathe."

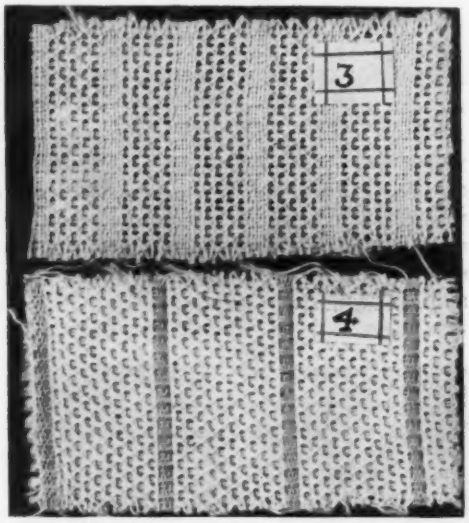
It is now some years since the material was first introduced and it was then used only for tennis, cricket and boating shirts. Lately, however, it has sprung into a variety of other uses, as in addition to summer shirtings, it is now being used for caps, cap linings, canvas shoes, and ladies' and men's underclothing. For the latter purpose it threatens to become a serious rival to knitted goods as it can be produced cheaper and at the same time possesses many of the properties of knit goods, such as porosity, softness of feel and a certain amount of elasticity.

The fabric is generally made of an ordinary soft two-fold cotton yarn for the warp and a soft spun single weft. In some cases ramie fibre is used both for warp and weft, giving to the cloth when finished a soft linen-like appearance, while in other cases, soft spun mercerized yarns are used.

An illustration of the fabric is given at Fig. 1. This is a typical example of the cloth when intended to be used for tennis or other shirtings. It is an allover leno fabric made with one end crossing round one, and woven two picks in a shed. The cell effect is obtained by using two warps of different tensions and drawing the leno ends from right to left and vice versa alternately.

The standard ends are woven tight and lie practically straight in the cloth, the take-up being about 5 per cent. The leno ends are woven very slack, an average take-up being about 80 per cent. Two picks are placed on the doup lift and two picks on the open shed lift alternately.

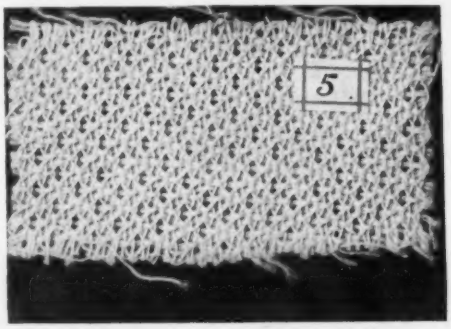




Every alternate leno end being drawn in the reverse way, an allover diamond effect is obtained. On account of the standard ends being tightly woven, the leno ends stand up somewhat on one side of the cloth, thus giving the cell effect. This cloth is known in the trade as a 2 and 2 cellular.

Another style of cellular fabric in the same quality and for the same purposes as the previous example is shown at Fig. 2. This is known as a 5 and 1 cellular. Tight and slack warps are used as before. The standard and leno ends weave plain for 5 picks and then 1 pick is placed on the doup lift.

It is important that the leno end be up and the standard end down on the pick immediately preceding and following the doup pick. Care must be taken when pegging the five plain picks to see that this is done, otherwise the five picks will not be properly



drawn together. When made up into garments, this particular type of cellular is often put together so that the wrong side of the cloth is presented to the eye; when this is done a decidedly knitted effect is obtained.

There is ample scope for the designer's skill in the way of stripe designs on either of these two grounds. Figs. 3 and 4 show two very good combinations on the 2 and 2 cellular ground. Fig. 3 is a solid plain

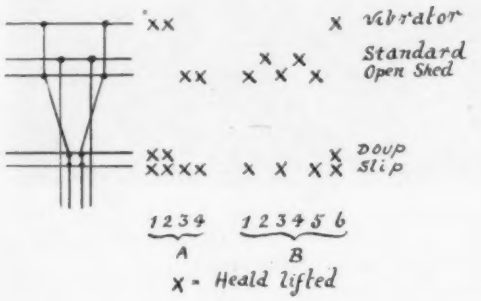


FIG. 6.

stripe, and the stripe effect in Fig. 4 is obtained by using colored mercerized yarn.

Standard qualities of Figs. 1 and 2 are about as follows: Reed = 29 dents per inch; 1 dent 2 ends (one standard and one leno); 1 dent empty; 40 to 48 picks per inch. Yarns: 2/20s warp (soft spun); weft, 14s to 20s (soft spun).

When intended for ladies' underclothing, finer reeds and yarns are used and more picks per inch put in. A suitable quality is as follows: Reed 35 dents per inch, 1 full, 1 empty, 80 picks per inch, 2/40s twist for

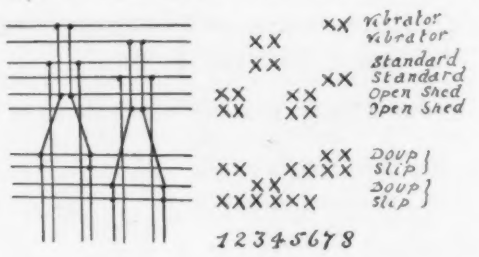


FIG. 7.

standard ends, 2/28s twist soft spun for leno and 34s weft.

The weave is generally similar to Fig. 2, but two picks would be placed on the doup lift, thus making the pattern repeat on six picks instead of five.

Another type of cellular that is now being made is illustrated at Fig. 5. This is known as a fancy cellular and gives a kind of all-over bird's-eye effect. Two doups are necessary for its production, working opposite to each other.

Fig. 6 shows draft for Figs. 1 and 2. The lifting plans are shown at A and B. Although the cloth can be made with one doup, it will be found better in actual practice to employ two doups and draw in alternately, both doups being lifted together. By this means the doups will not need to be so closely knitted on the shaft and better shedding can be obtained.

Fig. 7 shows draft and lifting plan for Fig. 5. Other particulars such as reed, denting, etc., are similar to Figs. 1 and 2.

One reason given before the British Tariff Commission for the continued export trade in tie silks was, "that no Englishman in any part of the world would wear a German-made cravat."

Surat cotton cannot be used in Great Britain on account of the objections of the operatives to the speed of the machinery. On the Continent the use of this cotton has increased largely since the American cotton reached its present high price.

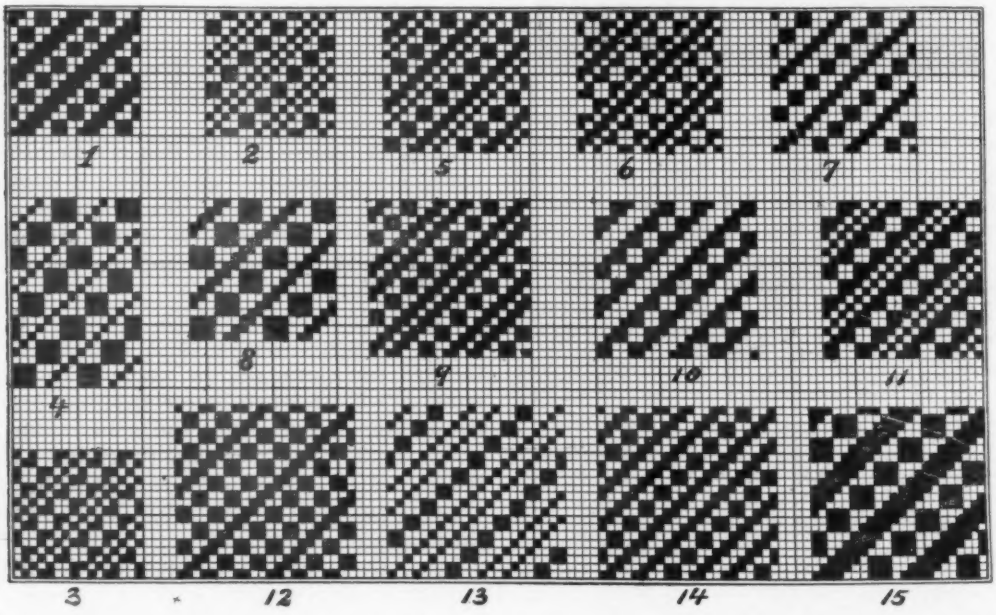
TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

OUR TEXTILE SCHOOL.

FANCY TWILLS HAVING BASKET-WEAVE EFFECTS.

This sub-division of our twill weaves give us an excellent variety of fancy effects for cotton, woolen, worsted and silk fabrics, hence a careful study of the 36 weaves specially designed for this article will prove of the greatest interest to the student, laying in turn the foundation for him to construct an endless variety of new weaves for any number of harness repeat when so required.



As indicated by the classification of these weaves, they are a combination of our regular 45° twills, having either large filling or warp floating with the basket weave effect introduced into either kind of said floats used. To explain this construction we will quote:

Weave Fig. 1 as having for its foundation twill the $^{3}/_{5}$ 8 harness regular twill, a 2 × 2 basket warp effect, being in turn introduced into the 5 filling float; the complete weave repeating on 8 × 8.

Weave Fig. 2 has for its foundation twill the $^{1}/_{1}$—$^{1}/_{5}$ 8 harness regular twill and when similar, as in the previously given example, a 2 × 2 basket, warp effect, is introduced into the 5 filling float. Repeat of weave 8 × 8.

Weave Fig. 3 shows the combination of the $^{1}/_{7}$ 8 harness twill in connection with a 2 × 2 basket, filling-effect, introduced into the filling float of the twill. Repeat of the weave is again 8 × 8; the weave being the reverse effect of the previously given example.

Weave Fig. 4 has for its foundation the $^{1}/_{7}$ 8 harness twill, a 3 × 3 basket, warp effect, being introduced in connection with the filling float of the twill, the characteristics of this combination being that the complete weave does not repeat until 8 × 24 on account of the three changes required to

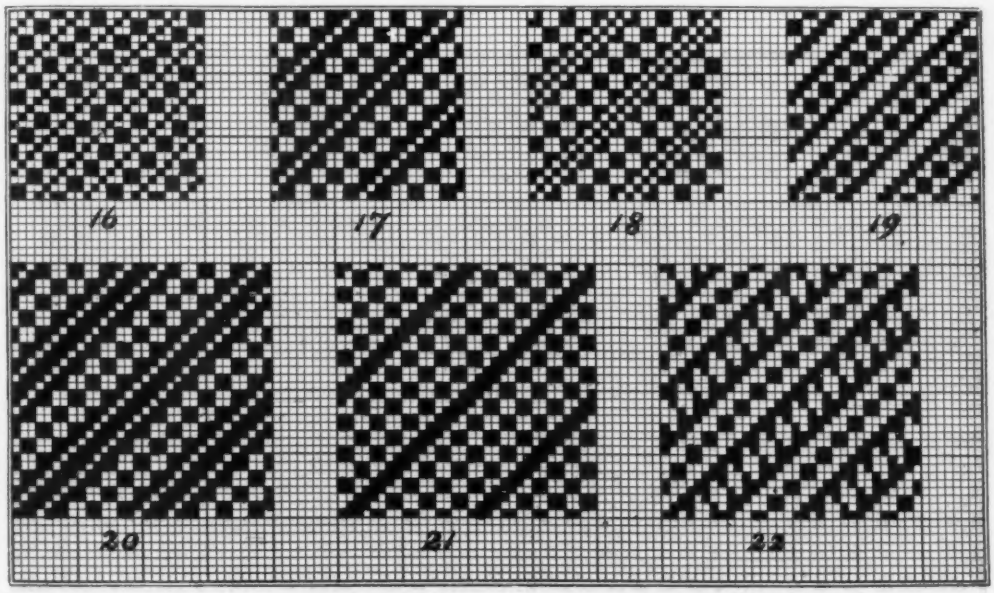
bring the 3 × 3 basket in proper position, filling ways, so as to repeat, i. e., 3 × 8 = 24 picks, repeat of weave filling ways.

Weaves Figs. 5 to 8 are fancy twills, repeating on 9 harness and 9 picks,

Fig. 5 having for its foundation the $^{2}\!-\!_{1}\!-\!^{1}\!-\!_{5}$ 9 harness 45° twill with a 2 basket, warp effect, introduced in the filling float of the twill.

Fig. 6 has for its foundation the $^{2}\!-\!_{7}$ 9 harness 45° twill with a 2 basket, filling effect, worked into the filling float of the twill.

Fig. 7 has the same foundation twill as the previously given weave, a 2 up, or warp



effect, basket being combined in the filling float with it.

Fig. 8 has again the same foundation twill as weaves 6 and 7, a 3 basket, warp effect, being in this instance introduced into the filling float.

Weaves Figs. 9 to 11 are a collection of 10 × 10 fancy twills of the present class, constructed thus:

Weave Fig. 9, for foundation use the $^{2}\!-\!_{1}\!-\!^{2}\!-\!_{5}$ 10 harness twill, the 2 up basket being added into the filling float of the twill.

Weave Fig. 10 has for its foundation the $^{7}\!-\!_{3}$ 10 harness regular twill, a 2 basket, filling effect, being in this instance introduced into the warp float of the foundation twill.

Weave Fig. 11 has for its foundation the $^{7}\!-\!_{1}\!-\!^{1}\!-\!_{1}$ 10 harness regular twill, with a 2 basket filling effect added into the warp float of the foundation twill.

Weaves Figs. 12, 13, 14 and 15 are four fancy twills of the present sub-division, repeating on 11 harness, the first three calling for 11 picks in the repeat of the weave, whereas the last quoted weave calls for 33 picks for its repeat.

Weave Fig. 12 has for its foundation the $^{2}\!-\!_{9}$ 11 harness 45° twill with a double line of 2 up baskets enclosing a single line of 2 down baskets introduced into the filling effect of the foundation twill.

Weave Fig. 13 has for its foundation the $^{1}\!-\!_{2}\!-\!^{1}\!-\!_{7}$ 11 harness 45° twill with a 2 basket warp effect introduced in the 7 filling float of the foundation twill.

Weave Fig. 14 has for its foundation the $^{2}\!-\!_{2}\!-\!^{2}\!-\!_{5}$ 11 harness 45° twill with a 2 basket warp effect for the 5 down filling float of the twill introduced into it.

Weave Fig. 15 has for its foundation twill the $^{4}\!-\!_{7}$ 11 harness 45° twill, having in turn a 3 basket, warp effect, introduced in its filling float. This combination of a 3 basket effect as used in connection with an 11 pick

twill, 11 not being divisible by 3, naturally will result in a repeat of the weave of 3 × 11 = 33 picks, i. e., 3 changes of position of basket required until repeat of fancy twill is obtained.

Weaves Figs. 16 to 19 are specimens of the present system of fancy twills repeating on 12 × 12;

Fig. 16: foundation twill $^{1}\!-\!_{5}$ 6 harness 45° twill. For basket use the 2 up warp effect, placing the latter for every alternate filling twill one pick out of the way.

Fig. 17: foundation twill $_{1}\!-\!^{11}$ 12 harness 45° twill, two 2 filling baskets and one 2 warp basket being introduced into the warp effect of the twill.

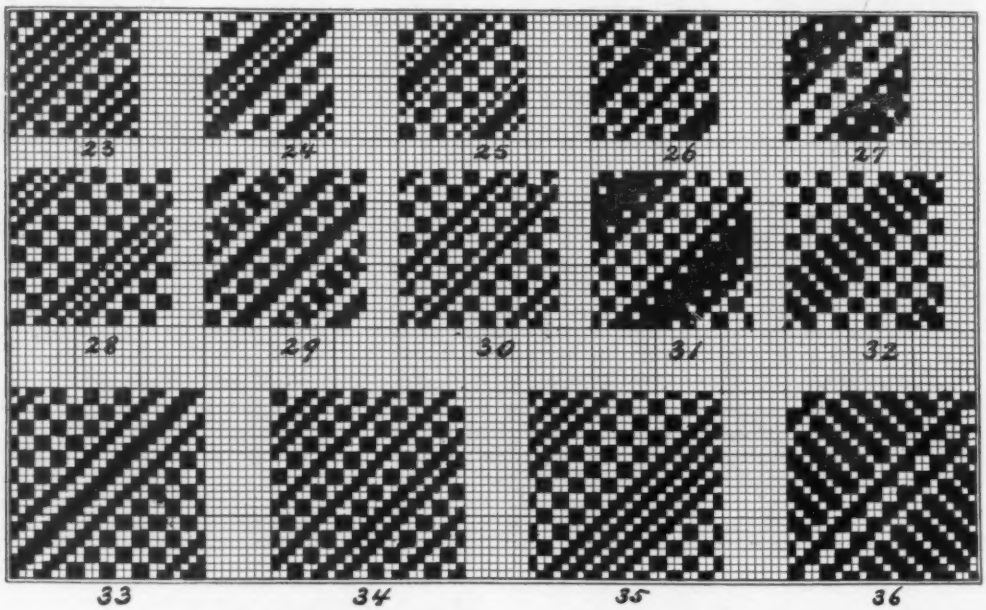


Fig. 18: foundation twill either the $_{1}\!-\!^{1}\!-\!_{1}\!-\!^{9}$ 12 harness or the $^{1}\!-\!_{11}$ 12 harness twill. In connection with the first quoted foundation twill the same arrangement of a basket effect as quoted in the previously given example is introduced in the warp effect of the foundation twill, whereas in connection with the later quoted foundation twill said basket effect is then placed in the filling effect of the foundation twill.

Fig. 19: foundation twill the $^{2}\!-\!_{5}\!-\!^{2}\!-\!_{3}$ 12 harness 45° twill, a 2 warp basket being introduced into the 5 down filling float.

Having thus far given a thorough explanation of the construction of the present system of fancy twills, the construction, i. e., foundation of the remaining twills of our collection will readily explain themselves, quoting that:

Weaves Figs. 20 to and inclusive 27 repeat on 16 × 16, weaves Figs. 28 to and inclusive 32 repeat on 20 × 20, and weaves Figs. 33 to and inclusive 36 repeat on 24 × 24.

MOULD SPOTS ON WOOLENS.

Mould spots are the result of fermentation, caused by the combination of moisture and heat, fungi being developed which generally first destroy the colors and if not detected in time, the fibre itself. Mould spots are more often formed during the hot summer months, and more particularly when moist goods are left in this condition laying around the room in piles for some time, preventing in turn the admission of air to the inner layers of the goods, which naturally then will heat. As mentioned before, mould spots generally first act upon the color of the goods, and this with a greater or less effect, according to the kind of dyestuffs used in coloring the yarn or cloth, some of them be-

ing more susceptible to mould than others: in fact, in connection with some, hardly any change or only a very slight change may be noticed. However, in a higher state of development the mould will destroy the fibre, and when such spots in the cloth then can be pressed through with the finger, for which reason, fulling, scouring, napping or teaseling, in turn will cause holes to appear in the cloth during these processes.

Mould spots formed in goods to be dyed in the piece, will make trouble in the dyehouse on account of the different behavior of the affected places toward every color. Mould spots are seldom formed in cloth after dyed in the kettle, the wool then having been boiled for some time in this operation; what will make us consider the question, if not the boiling of the wool, to a certain extent, is a preventive against mould, i. e., that it partly destroys any impurities adhering to the wool, like yolk, fat, etc., or if not destroying them, at the least converts them into substances less apt to assist in the formation of mould spots. It is also possible that the mordants like alum, cream of tartar, sulphuric acid, chromate of potash, sulphate of iron, etc., as used in connection with such dyeing, may act as a preservative in some instances. The greater tendency of vat-blue goods to mould, as compared to goods requiring boiling during dyeing, more or less hold up this assertion, since indigo-blue wool is not boiled in dyeing, although indigo in itself is inclined to fermentation.

Mould spots are found most frequently to occur in the cloth as it leaves the loom, and in pieces coming from the fulling mill, provided they are not scoured at once, i. e., left for some time laying in piles before scouring them. Provided they cannot be scoured at once, say for example goods leaving the fulling mill on a Saturday—before closing time, or that possibly the cloth washer broke down or trouble to the transmission, be sure that they are not left laying in piles but are opened out so that they cannot heat.

Natural impurities clinging to the goods, as well as the various ingredients introduced during the stages of its manufacture, are the best friend for assisting in the forming of mould spots, what accounts for the greater inclination of the raw cloth to become mouldy and when residues of yolk, dyestuff, oil, glue, sizing, etc., in the cloth and when the latter in a moist condition is left laying around the room, all contribute largely toward the heating of the cloth, more so when having a sultry, sticky weather, especially on ground floors, and when to the humidity of the cloth then is added that of the ground. Keep the floors of the mill clean and free from mould and fungus formations, since the development of mould in the cloth progresses much more quickly in a place where it already exists. Provided pieces before required for the fulling should be moist, the same then should be dried at once and stored in an airy but by no means moist room.

Carbonization is a protection against the formation of mould, for which reason cloth requiring carbonizing, should therefore be carbonized as soon as possible, since storing them wet after neutralizing is then connected with less danger. Not only will carbonizing serve as a preventive of mould, but it will also improve pieces that have already become mouldy. The carbonizing of pieces of cloth, in which mould spots appear, with sulphuric acid before dyeing is recommended in order to prepare these spots to take the dye again. This is correct, if dealing with fungi, i. e., mould in its first stage; but when the destruction of the fibre has already begun carbonization will not be of much help.

Another ingredient which will help towards mould spots in connection with pieces fulled and not scoured at once is soap. It appears that the decomposition of dyestuff and fibre by the soap, is a process differing from the actual formation of mould, as if the alkali had a destroying effect in consequence of the heating. In the case of fulled cloth not scoured, a few hours' storage only may be necessary to produce mould spots of larger size and more injurious character than mould spots formed otherwise, and for which reason fulled cloth should always at once be placed in the cloth washer, and if this should not be possible, it then should be scoured in the fulling mill.

A frequent cause of mould spots is found in the prolonged storing of scoured pieces

upon the bottom of the fulling or cloth washers, even when they are clean and only contain traces of soap, since in the bottoms of old machines, the wood may be already in a state of decomposition, a feature which naturally promotes the formation of mould spots. For the same reason do not permit any old cloth horses, trucks or benches, the wood of which is decaying, around the wet finishing department of the mill. There is little chance for a perfectly clean fabric even if wet for some time, becoming mouldy.

The proper scouring of the wool, from points thus far quoted, naturally forms an important point with reference to the chance of mould, and for which reason cloth made from wool poorly scoured, runs in all stages of its manufacture a greater risk from becoming mouldy than when the wool had been scoured well.

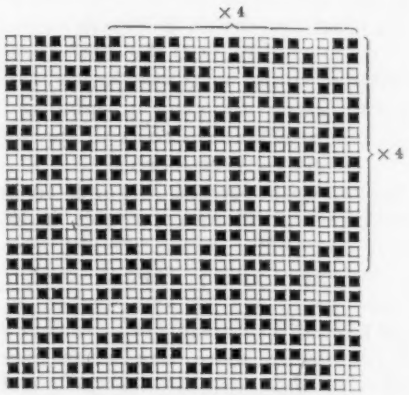
Both heating and formation of mould may occur in cloth manufactured from poorly scoured wool, especially when after gigging, the fabric is left lying for any length of time in piles with other similar pieces. Heating occurs more readily in wet pieces smoothly folded than in such as irregularly and less wet, and which possibly is due to the high temperature of river water in the summer, as well as the fact that after gigging, smoothly and regularly folded cloth lies generally very compactly, so that the admission of air is impossible.

In order to protect yourself against the formation of mould spots in fabrics, see to it that moist cloth never lies longer in that stage than is absolutely necessary, but see that the wet pieces are dried as soon as possible, and under no circumstances let them accumulate in a wet condition in a warm place, or where the rays of the sun may strike them. Provided the cloth in question has not been scoured, the chance for mould spots forming are then increased.

In an important case tried recently in Cincinnati, it was decided that the term "Extra Super," as applied to carpets, means simply an ingrain carpet; it may be 10, 11, 12, 13 or 14 pair 1080 ends, and may be wool, union, or cotton.

FOREIGN NOVELTIES.

Fancy Worsted Suiting.



Complete Weave.
Repeat 72×72.

Warp—2560 ends, 2/22s worsted, 20 harness, fancy draw.

Reed—10×4=64 inches wide in the loom.

Dress—

2 ends, dark	=	2 ends
4 ends, light / 4 ends, dark × 4	=	32 ends
4 ends, light	=	4 ends
2 ends, dark	=	2 ends
1 end, dark and lively	=	1 end
1 end, dark	=	1 end
4 ends, light	=	4 ends
4 ends, dark / 4 ends, light × 3	=	24 ends
2 ends, dark	=	2 ends
Repeat of pattern:		72 ends

Filling—40 picks per inch, same arrangement counts and colors as in warp.

Finish—Worsted finish, 56″ wide.

Fancy Worsted Suiting.

Complete Weave.
Repeat 4×4.

Warp—3432 ends, 12 harness, straight draw.

Reed—15½×4=66 inches wide in the loom.

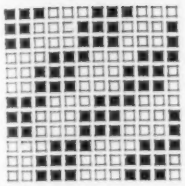
Dress—

8 ends, 2/50s worsted, light / 8 ends, 2/50s worsted, dark	× 2	=32 ends
6 ends, 2/50s worsted, light / 6 ends, 2/50s worsted, dark	× 2	=24 ends
Repeat of pattern:		56 ends

Filling—52 picks per inch, same arrangement counts and colors as per warp.

Finish—Worsted finishing; 56″ wide.

Fancy Worsted Suiting.



Complete Weave.
Repeat 6×6.

Warp—4095 ends, 12 harness, straight draw.

Reed—16×4=64 inches wide in the loom.

Dress—

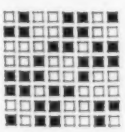
2 ends, 2/32s worsted, dark	= 2 ends
1 end, 2/32s worsted, lively	= 1 end
3 ends, 2/32s worsted, light	= 3 ends
3 ends, 2/32s worsted, dark 3 ends, 2/32s worsted, light	× 15=90 ends
Repeat of pattern:	96 ends

Filling—68 picks per inch, arranged thus:

2 picks, 2/32s worsted, light	= 2 picks
1 pick, 2/32s worsted, dark	= 1 pick
1 pick, 2/32s worsted, light	= 1 pick
1 pick, 2/32s worsted, dark	= 1 pick
1 pick, 2/32s worsted, lively	= 1 pick
2 picks, 2/32s worsted, light 1 pick, 2/32s worsted, dark 1 pick, 2/32s worsted, light 2 picks, 2/32s worsted, dark	× 17=102 picks
Repeat of pattern:	108 picks

Finish—Worsted finish, 56″ wide.

Worsted Suiting.



Complete Weave.
Repeat 8×8.

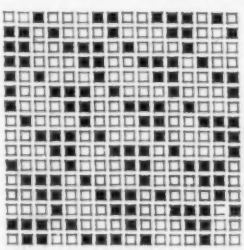
Warp—3456 ends, 2/32s worsted, dark blue, 16 harness, straight draw.

Reed—13½×4=64 inches wide in the loom.

Filling—52 picks per inch, 2/32s worsted, black.

Finish—Worsted finish, 56″ wide.

Worsted Suiting.



Complete Weave.
Repeat 16×16.

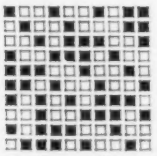
Warp—5280 ends, 2/36s worsted, dark gray, 16 harness, straight draw.

Reed—20×4=66 inches wide in loom.

Filling—65 picks per inch, 2/36s worsted, dark gray.

Finish—Worsted finish, 56 inches wide.

Worsted Suiting.



Complete Weave.
Repeat 10×10.

Warp—3432 ends, 20 harness, straight draw.

Reed—15½×4=66 inches wide in the loom.

Dress—

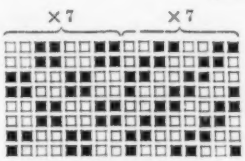
1 end, 2-ply, 2/50s worsted, light. 1 end, 2 ply, 2/50s worsted, dark	× 9= 18 ends
3 ends, 2-ply, 2/50s worsted, light 3 ends, 2-ply, 2/50s worsted, dark	× 2= 12 ends
1 end, 2-ply, 2/50s worsted, light 1 end, 2-ply, 2/50s worsted, dark	× 9= 18 ends
2 ends, 2-ply, 2/50s worsted, light 2 ends, 2-ply, 2/50s worsted, dark	× 12= 48 ends
Repeat of pattern:	96 ends

Filling—52 picks per inch, arranged thus:

2 picks, 2-ply, 2/50s worsted, dark	=2 picks
2 picks, 2-ply, 2/50s worsted, light	=2 picks
Repeat of pattern:	4 picks

Finish-Shrinkage at the fulling, 6 per cent.; clear finish, 56″ wide.

Worsted Suiting.



Complete Weave.
Repeat 112×4.

Warp—3690 ends, 8, 12, or 16 harness, fancy draw.

Reed—28×2; split basket by reed, 66 inches wide in loom.

Dress—

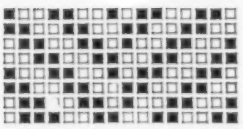
24 ends, 2/36s worsted, black	= 24 ends
1 end, 2/36s worsted, light green 1 end, 2/36s worsted, black	× 4 = 8 ends
33 ends, 2/36s worsted, black	33 ends
1 end, 1/28s worsted, black and light blue silk twist 2 ends, 2/36s worsted, black	× 2= 6 ends
1 end, 1/28s worsted, black and light blue silk twist	= 1 end
8 ends, 2/36s worsted, black	= 8 ends
	× 2= 30 ends
1 end, 1/28s worsted, black and light blue silk twist 2 ends, 2/36s worsted, black	× 2 = 6 ends
1 end, 1/28s worsted, black and light blue silk twist	= 1 end
10 ends, 2/36s worsted, black	= 10 ends
Repeat of pattern:	112 ends

Filling—58 picks per inch, arranged thus:

40 picks, 2/36s worsted, black	= 40 picks
1 pick, 2/36s worsted, light green 1 pick, worsted, black	× 4 = 8 picks
39 picks, 2/36s black	= 39 picks
1 pick, 1/28s worsted, black and light blue silk twist 2 picks, 2/36s worsted, black	× 2= 6 picks
1 pick, 1/28s worsted, black and light blue silk twist	= 1 pick
8 picks, 2/36s worsted, black	= 8 picks
	× 2= 30 picks
1 pick, 1/28s worsted, black and light blue silk twist 2 picks, 2/36s worsted, black	× 2 = 6 picks
1 pick, 1/28s worsted, black and light blue silk twist	= 1 pick
Repeat of pattern:	124 picks

Finish—Worsted finish, 56 inches wide.

Fancy Cassimere.



Complete Weave.
Repeat 144×4.

Warp—3340 ends, 8, or 16 harness, fancy draw.
Reed—12½×4=67″ wide in loom.
Dress—

1 end, 5 run, light drab 1 end, 2 ply, 7 run, black and white twist	× 3	= 6 ends
1 end, 4½ run, green drab, mix 1 end. 2 ply, 7 run, black and white twist	× 3	= 6 ends
1 end, 5 run, light drab 1 end, 2 ply, 7 run, black and white twist	× 3	= 6 ends
1 end, 2/48s worsted, orange 1 end, 2 ply, 7 run, black and white twist	× 2	= 4 ends
1 end, 2/48s worsted, yellow		= 1 end
1 end, 2 ply, 7 run, black and white twist		= 1 end
1 end, 5 run, light drab 1 end, 2 ply, 7 run, black and white twist	× 3	= 6 ends
1 end, 4½ run, green drab mix 1 end, 2 ply, 7 run, black and white twist	× 3	= 6 ends
1 end, 5 run, light drab 1 end, 2 ply, 7 run, black and white twist	× 3	= 6 ends
1 end. 2/48s worsted, green 1 end, 2 ply, 7 run, black and white twist	× 2	= 4 ends
1 end, 2/48s worsted, yellow		= 1 end
1 end, 2 ply, 7 run, black and white twist		= 1 end
1 end, 5 run, light drab 1 end, 2 ply, 7 run, black and white twist	× 3	= 6 ends
1 end, 4½ run, green drab mix 1 end, 2 ply, 7 run, black and white twist	× 3	= 6 ends
1 end, 5 run, light dark 1 end, 2 ply, 7 run, black and white twist	× 3	= 6 ends
1 end, 4½ run, brown mix		= 1 end
1 end, 2 ply, 7 run, black and white twist		= 1 end
1 end, 4½ run, brown mix		= 1 end
3 ends, 2/48s worsted, yellow		= 3 ends
1 end, 5 run, light drab = 1 end 1 end, 2 ply, 7 run, black and white twist = 1 end 1 end, 4½ run, green drab mix = 1 end 1 end, 2 ply, 7 run, black and white twist = 1 end 1 end, 5 run, light drab = 1 end 1 end, 2 ply, 7 run, black and white twist = 1 end 1 end, 4½ run, brown mix = 1 end 1 end, 2 ply, 7 run, black and white twist = 1 end	× 3	= 24 ends
1 end, 5 run, light drab		= 1 end
1 end, 2 ply, 7 run, black and white twist		= 1 end
1 end, 4½ run, green drab mix		= 1 end
1 end, 2 ply, 7 run, black and white twist		= 1 end
1 end, 5 run, light drab		= 1 end
1 end, 2 ply, 7 run, black and white twist		= 1 end
1 end, 4½ run, green drab mix		= 1 end
1 end, 4 run, red brown 1 end, 5 run, light drab 1 end, 2 ply, 7 run, black and white twist 1 end, 4½ run, green drab mix 1 end, 4 run, red brown 1 end, 5 run, light drab 1 end, 2 ply, 7 run, black and white twist 1 end, 4½ run, brown mix	× 2	= 16 ends
1 end, 2 ply, 7 run black and white twist 1 end, 5 run, light drab 1 end, 2 ply, 7 run, black and white twist 1 end, 4½ run, green and drab mix 1 end, 2 ply, 7 run, black and white twist 1 end, 5 run, light drab 1 end 2 ply, 7 run, black and white twist 1 end, 4½ run, brown mix	× 2	= 16 ends
1 end, 2 ply, 7 run, black and white twist		= 1 end
1 end, 5 run, light drab		= 1 end
1 end, 2 ply, 7 run, black and white twist		= 1 end
1 end, 4½ run, green drab mix		= 1 end
1 end, 2 ply, 7 run, black and white twist		= 1 end
1 end, 5 run, light drab		= 1 end
3 ends, 2/48s worsted, yellow		= 3 ends
Repeat of pattern:		144 ends

Filling—60 picks per inch, arranged thus:

8 picks, 4½ run, dark green	= 8 picks
16 picks, 4½ run, black	= 16 picks
Repeat of pattern:	24 picks

Finish—Melton finish; 56″ wide.

WASTE IN WOOLEN MILLS.

Among the different kinds of waste met with in a woolen mill and which have to be prepared so that they can be re-used, we find, burr waste, card waste, hard waste, rags, flocks, and sweepings.

Burr waste in a woolen mill represents the refuse material knocked out of the wool in connection with what is known as a very burry wool, by the burr picker, or in connection with the other wools containing less burrs and this of such a kind where a special burr picking is not necessary by the action of the burr cylinder, as attached to the breaker cards at the point where the material is about to enter said first breaker of the set of cards. A long box is adjusted immediately above the feeding mechanism, and in line with the burr cylinder, and when all the burrs as well as other impurities, and this with some good wool fibres naturally adhering to it, which are too bulky and besides not wanted to pass into the card, are prevented from going farther by being thrown into this box, and from which they are removed at regular intervals during the day.

Since all wool contains a large variety of impurities, which must be removed by this means before it enters the card, these burring attachments are found in general use on the breaker cards in woolen mills, and when with such a large number of machines according to number of sets of cards in the mill, constantly accumulating this refuse matter, it bears an important relation to the management of the mill to properly re-use such waste.

Some of the burr waste, more particularly such as coming from the burr picker, and when handling very burry wools, may be of little, if any, value, in fact, not worth the expense of carting them away, whereas other burr waste, more particularly such as coming from the burring attachment of the breaker card, in turn is re-worked again by first carbonizing said waste, dusting and re-working it in connection with wool into lower grades of yarn In place of this carbonizing, some of the better burr waste as coming from the burring attachment of the breaker card, may be cleaned by dusting and if necessary run-

ning the same afterward through a burr picker.

Burr waste after cleaning it from its foreign impurities is made up of a combination of short and long wool fibres united in a body about one another, and when then the question arises, how to reduce these lumps of fibrous matter to the proper form for ready use in carding, i. e., how to disentangle the more or less knotted fibres and re-arrange them in the proper shape for carding, and that is done by means of the steel toothed cylinders of the garnett machine, which in turn prepare said burr waste for future carding, as is generally done, in combination with wool.

Card waste is the refuse of wool remaining in and adhering to the teeth of the card clothing of the set of carding engines, and is daily removed from said clothing by stripping the cylinder and the rollers of the card by means of hand cards. With certain grades of stock, card waste accumulates more than with others, for the fact that the condition of the stock, i. e., its cleanliness also greatly influences this point. Card waste as a rule is easily re-worked, preparing it for this purpose by running the same through a duster, which not only removes all the dust and loose foreign substances from the waste thus treated, but at the same time has a tendency to open and disentangle the fibres, thus greatly assisting in the preliminary process of preparing the staple for re-use again, in combination with a better quality of stock. Again, a reasonable percentage of such cleaned card waste can any time be added to a corresponding new lot as the one from which it was taken, in this instance being properly incorporated to said new lot previously to mixing and picking the latter, for the fact that the fibre in clean card waste is comparatively good. In all cases it is suitable for use in the manufacture of a large range of woolen fabrics, and in practice it is usual to mix it with a certain percentage of new stock, and in this way it may be introduced into an almost unlimited variety of goods.

Hard waste, i. e., hard ends also represents an important factor in the woolen mill. It is produced in the spinning, spooling, dressing and weaving departments of the mill.

In the spinning department hard ends are the result of breakages, which require the operator to make a yard or two of waste spun yarn, before the end is pieced on again.

In the spooling process hard waste is made when the girl pulls off several yards of yarn, at intervals, when a broken end is to be tied up.

In the dressing department, hard ends result by breaking of ends, as well as from a surplus accumulation of odd ends when spools are not allowed to run entirely out, more particularly when changing from one work to the other.

With reference to the weaving department of the mill, hard waste is caused by the necessary accumulation of filling on the bobbins, which, instead of going into the cloth, was left on the bobbins, probably for the reason that the remaining yard or two was not long enough to reach the entire width of the fabric, and it must, therefore, be allowed to go to waste. In addition to filling waste, there are warp threads breaking during weaving and which need re-tying and which thus produce hard waste. Another source for said hard waste is the remnant of each warp as remains in the harnesses, i. e., the last portion of each warp, and which cannot be woven up, and consequently goes to waste when the set of harnesses are taken out from the loom.

These hard ends are in turn rendered fit for use, i. e., brought to a fibrous condition, by passing them through the garnett machine, a coarse card which prepares them for spinning into lower counts of yarn in connection with good wool. Garnett machines are made with one, two, three or more main cylinders, from thirty to sixty inches in width. Over each cylinder are placed five or more self-stripping workers four inches in diameter. The fancy and strippers are nine and six inches in diameter respectively. Unlike the fancy of the wool card, the fancy on this machine does as much carding as the workers, by combing the stock across the teeth of the stripper when it raises it from the main cylinder, so that it may be lashed against the doffer. Garnett machines will reduce to fibre the finest

double and twist wool yarn waste, burr waste and all kinds of clippings, both cotton and wool, doing from 200 to 300 pounds a day. All the cylinders of the garnett machine are covered with steel teeth prepared expressly for the purpose. The steel is rolled out into triangular, or wedge shaped wire, from which the teeth are cut. This wire is inserted and secured in grooves, which are cut spirally in the cylinders, at a suitable depth, and of proper width to receive the thick edge of the wire. Teeth inserted in this manner, as will be readily understood, possess great strength and durability, and are well adapted for the work they are designed for.

Rags as produced in a wool mill are the clippings from the ends of fabrics as trimmed for the market, samples, etc., and in turn are re-manufactured for future use in the mill by passing them first through a rag picker and in turn through a garnett machine or a shoddy card. The chief constituents of a rag picker are its feed apron, feed-rollers, cylinder and trunk for conducting the rough shoddy out of the machine. The cylinder, which is the main feature of the machine, is strongly built and runs in brass bottom steps. The average length of it, in a typical machine, is 31 inches from point to teeth, 19 3/4 inches wide, and 16 1/2 inches on face of teeth. They are made with middle casting of solid iron, with double flanges, the lags being bolted on alternately, bringing each bolt through opposite side of flanges, by which means the bolts are not all in the same circle, thus presenting as near as possible a full surface of teeth, besides making the cylinder much stronger. The teeth are made from best English steel, evenly hardened and tempered, and put in the wood in such a manner that it is very rare for one to come out, lag or split. For pulling of ordinary soft woolen rags, the cylinder generally contains 10,000 teeth, made from number 10 steel, and for sorted hard woolen rags, which, however, as a rule, does not refer to rags produced in the mill, referring to rags, the result of woolen fabrics, clothing, etc., and which contain cotton seams—12,000 or 13,000 teeth of number 11 steel. The teeth are 2 1/4 inches long; top lags are 1 1/4 inches thick; teeth stand out 1 inch. The rags to be picked are placed in the feed-apron, which in turn forwards the same to the feed-rolls. On emerging from them they are seized by the teeth of the cylinder, which not only separates thread from thread but actually tears fibre from fibre, reducing the rags to a flossy wool-like state. As the rags are pulled apart into their original constituents, the material is forced (blown) down and out the trunk, finding exit from the machine to the stock house (a house built at the back, to hold the stock and connected with the picker below the feed table by previously-mentioned trunk). Any hard fragments not well picked fall into a cage from which they are off and on taken and replaced on the feed-apron of the rag picker.

Flocks are of two kinds, viz.: such as produced by the shear and which are known as shear flocks and as a rule are in a proper condition for use in the wet finishing department; and second, flocks produced by means of gigging or napping the goods. The latter have to be cleaned of any hard substances before submitting them to the flock cutter, since otherwise, the blades of the latter machine would get ruined. This cleaning of flock-stock is done by running the latter through a flock-renovator, where the stock is not only opened and put in the best condition for cutting, but all foreign, heavy substances, as previously referred to, will fall to the bottom of the machine and not go through with the stock, and in turn spoil the blades of the flock cutter.

The gigged flocks are fed to this flock renovator from a hopper as situated on the top of the machine, which somewhat in its principle of construction resembles a dome duster, and when the stock after being opened is blown out of the machine by a fan, through an outlet in the former at its larger cone end, the machine being usually arranged to blow the stock into a small room partitioned off for the purpose, the usual speed of the machine being 800 to 1,000 r. p. m. After the duster prepared, i. e., cleaned these gigged flocks, they are then in turn submitted to the flock cutter, a machine designed for transforming the clean gigged flocks into the product commonly known as flocks. Special features of the

modern flock cutter are the means for making its cylinder reversible and the blades self-sharpening, the novel arrangement for feeding in the stock and vibrating the cylinder, as well as the mode of holding attached blades into the bed. The vibrating attachment prevents the cylinder from running in one place, and in turn wearing grooves in the blades. In older styles of flock cutters, and where the cutting cylinder is made to revolve continually in one direction, the cutting edge of the blade soon becomes dull, and simply grinds or mashes the flocks; the only remedy in such cases being to frequently grind or sharpen the blades, which, of course, consumes much time and involves considerable expense and trouble. This trouble, as previously mentioned, is overcome in the construction of modern makes of flock cutters and when this frequent grinding is done away with, since the peculiar construction of the blades, the reversible feeding device and the arrangement of the discharge orifices, render the blades self-sharpening. There are sixteen blades, 28 inches long, in the cylinder, and nine blades in the bed. The central portion of the blades is iron, covered on each side with a plate of steel, welded onto the iron and hardened, so that the central portion will readily wear away and leave a steel cutting edge on each side. As the machine is used in cutting flocks, the natural consequence is that each of the blades is dulled at one edge and sharpened at the other. By means of the driving belts, the cylinder is made to revolve in either direction at will, allowing the sharp edge of the blades to be always used for cutting the stock, and as the motion of the cylinder is reversed, the flocks are carried in either direction and discharged at either end of the machine, while at the same time all the blades in both, cylinder and bed, are rendered self-sharpening. As the blades in the bed wear away, they may be adjusted from time to time either separately or collectively, as may be required. The average production of such a modern make of flock cutter is from 1,000 to 1,200 pounds a day on gigged flocks.

Do not cut the flocks too fine, for the reason that such a flock will not felt as well as a longer one, on account of possessing too little surface for the felting, and while such flocks apparently go on the goods more readily, they also leave or drop out just as quickly. A very fine flock indicates that the machine has been set too tight, so that the stock is being ground rather than cut.

Sweepings, as will be readily understood, are the refuse of the wool of the mill, and which must contain any amount of good wool fibres. The first process said sweepings will be submitted to will be to give them a good dusting, in order to liberate the greatest amount of dirt and dust as well as foreign impurities, after which they are treated somewhat like the gigged flocks previously explained; first run through the renovator, in order to give them an additional and more thorough cleaning, and after which they are cut up into flocks on the machine previously explained.

A NOVEL PICKING MOTION.

The object of the new device is to guide the picker stick during its movement in such a manner that the point of contact between its picker and the point of the shuttle remains the same throughout the interval of the stroke, in turn imparting to the shuttle a more steady throw as well as to minimize the shock to the shuttle, at the same time storing up energy through the force of the shuttle in the backward stroke of the picker stick, in order to aid the forward stroke of the latter.

In order to be able to give a clear idea of the construction and operation of the new device, the accompanying two illustrations are given and of which Fig. 1 shows the new device in its front elevation, showing at the same time portions of the loom-frame, lay-beam, etc., i. e., those portions of a loom to which the new device more particularly refers, the picker stick being shown in its vertical position. Fig. 2 is a view in detail, showing the working construction of the device when the picker stick is in its most forward position.

Numerals of reference accompanying illustrations indicate thus: 1, a portion of the loom frame; 2, a portion of the lay and upon

which the shuttle runs in its travel through the shed as is formed by the warp threads. 3 shows us the lay rock-shaft, to which is fastened the guide plate, 4, in which is formed a vertical guide slot, 5, and a curved guide slot, 6, the latter being placed above the vertical slot in such a position so that it will extend both to the left and right of a

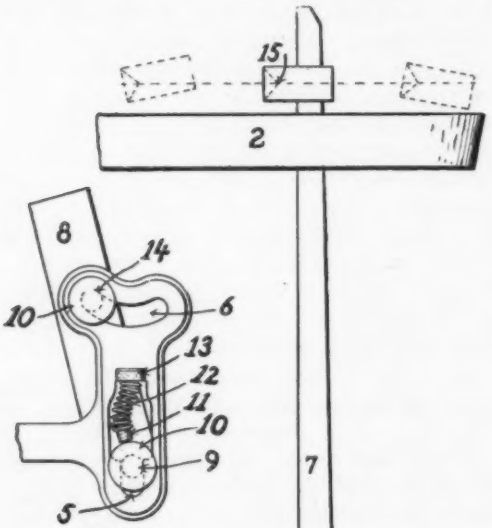


Fig. 2.

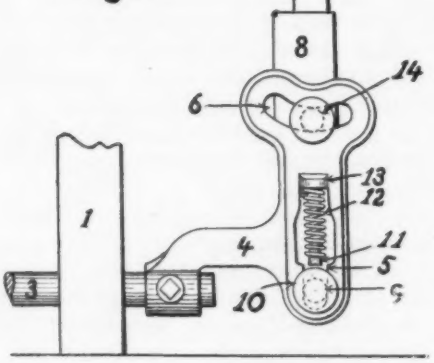


Fig. 1.

straight line passing through and above the middle of the vertical slot.

The picker stick is indicated by numeral of reference, 7, and in turn is securely supported in a metallic case, 8, which at the same time serves as a reinforcement to the picker stick, as well as furnishing bearings for the fulcrum and guide bolts.

Located in the vertical guide slot, 5, is a fulcrum stud, 9, the shank of which passes through this slot and through a hole in the picker stick, 7, and its case or holder, 8. This fulcrum stud, 9, consists of a head, 10, which bears against the outer face of the guide plate, 4, the stud being also supplied with a shoulder and an anti-friction sleeve roller situated inside the guide-plate, 4, in turn forming a part of the device for clamping the picker-stick and its holder, 8, to guide-plate, 4, by means of a nut, washer and locking sleeve (not possible to be shown, since located in back of the plate, 4, i. e., more particularly in back of the head, 10, of the fulcrum stud, 9).

From the picker stick holder, 8, or from the picker stick itself when a holder is not used, projects a lug, 11, provided with a finger which acts as a support for the lower end of a compression spring, 12, the finger of the lug extending part way into the spring, thus holding the lower portion of spring, 12, in position.

The vertical slot, 5, in the guide-plate, 4, is upwardly enlarged, in order to provide room for the spring, 12, and which bears on its upper end against a lug, 13, which projects from the guide-plate, 4, itself and also is provided with a finger extending downward and part way into spring, 12, so as to keep the upper end of the spring in position.

Passing through the curved slot, 6, and then through the picker-stick, 7, and its holder, 8, provided such is used, is a guide stud, 14, similar in detail and clamped in the same manner as stud, 9. The curvature of this slot, 6, and its disposition relative to the vertical slot, 5, are such that when the picker stick is rocked to throw the shuttle, the guide stud, 14, will travel up the course of the curved slot, causing the striking-point of the picker, 15, and that of the shuttle to move in a straight line as shown by the dotted lines in Fig. 1.

When the guide stud, 14, on the forward throw of the picker stick, is moving upwardly in the curved guide slot, 6, the fulcrum stud, 9, at the same time will be raised vertically in the slot, 5, thus causing the picker stick, 7, to change from a vertical to the inclined position as shown in Fig. 2, the lug, 11, which

is a part of the holder or picker-stick itself as the case may be, moving upwardly and laterally and at the same time carry the lower end of the spring, 12, with it. The upper end of the spring, however, is held stationary on account of its engagement to the finger and lug, 13, and which are a part of plate, 4, as before explained.

This operation produces a peculiar compressing effect to the spring, 12, causing it to compress upwardly and at the same time bending itself somewhat, as clearly shown in Fig. 2. On its return, the shuttle will cause the picker stick to return from its forward incline to its former vertical position, this movement causing the spring, 12, to straighten out and when this reflex movement of the spring will aid in bringing back the picker stick. However, the picker stick in turn moves past the vertical and when then the guide stud, 14, is carried up the back part of the curved slot, 6, this motion causing the fulcrum stud, 9, again to be raised in its vertical slot, 5, in turn again compressing and bending the spring, 12, as before, but this time in the reverse direction.

This will clearly demonstrate to the reader that spring, 12, serves not only as a slow-down for the picker stick, but at the same time softens the blow of the latter against the end wall of the slot in the lay and in which the picker stick travels to and fro. Thus we have, by means of the new picking mechanism, energy stored up in the compressing of the spring, 12, and which in turn aids in the forward stroke of the picker stick.

A NEW SHUTTLE BOX BINDER ATTACHMENT TO CROMPTON & KNOWLES DROP BOX LOOMS.

The attachment more particularly refers to their blanket looms, and in which looms the

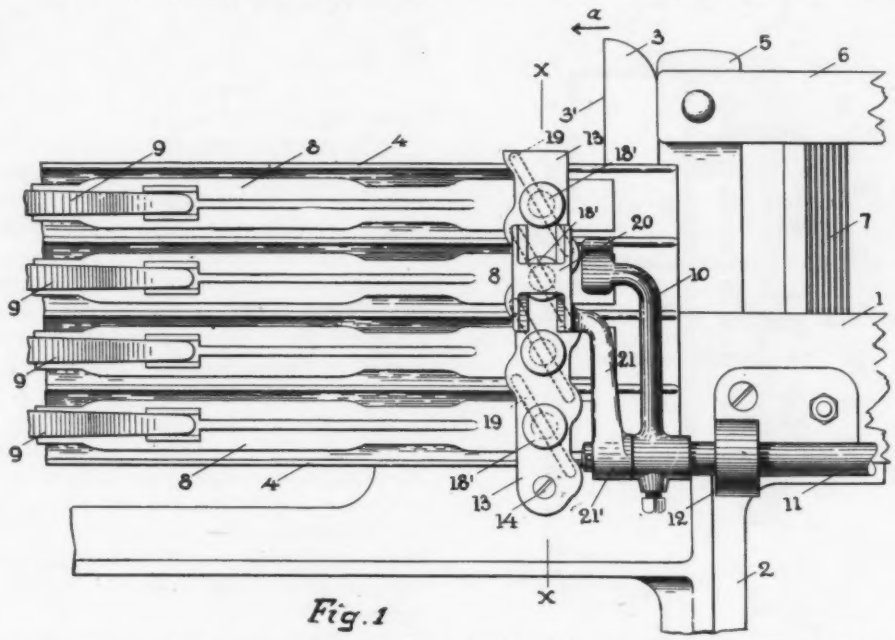


Fig. 1

body of the fabric, i. e., a considerable length of it, is woven with the same shuttle, and when it is important to hold the shuttles not in use in their shuttle boxes, and prevent any longitudinal movement or working loose of the shuttles by the motion of the loom. To accomplish this feature is the object of the new attachment and by means of which the box-shuttle binders are pressed against all the shuttles in the shuttle-boxes except the active or running shuttle.

Of the accompanying illustrations, Fig. 1 is a detached portion of one end of the lay of a loom and of four drop-boxes carried thereon, also showing the new attachment

provided to the boxes. Fig 2 is a section in detail on line x — x, Fig. 1, looking in the direction of arrow a, same figure.

In said illustrations numerals of reference 1 to and inclusive 12 refer to regular parts of the loom as built at present, viz: 1 the lay-beam, supported on the upper end of the lay-sword 2, which carries a stand 3, having a guide 3′ at its inner end for the vertically moving shuttle-boxes 4.

The lay-horn is indicated by 5, the hand-rail by 6, the reed by 7, the shuttle-binders by 8, the shuttle springs, as press on the latter, by 9. The protector-finger for engaging the inner free end of the shuttle-binder 8

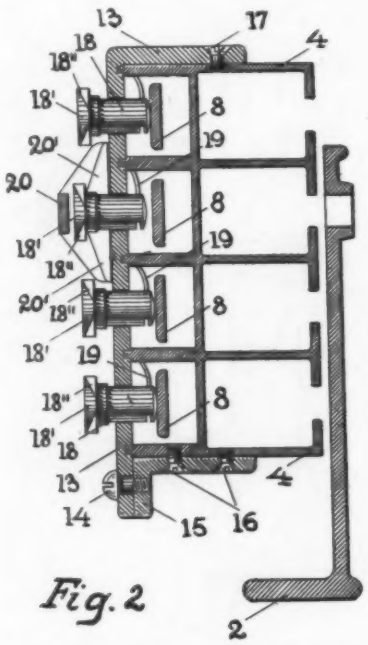


Fig. 2

on the shuttle-box, which is in line with the race-way of the lay, is indicated by 10, said protector-finger being fast on rock-shaft 11 of the protector mechanism, as is mounted in bearing 12 on the lay-beam of the loom.

With reference to the new attachment we find at the inner end of the shuttle-boxes and on the front side of said boxes and just outside of the upper end of the protector-finger, a plate 13, secured at its lower end (see Fig. 2) by a screw 14 to an angle-plate 15, as secured by screws 16 to the under side of the shuttle-boxes; the upper end of said stand 13 extending over the top of the shuttle-boxes and being secured thereto by a screw 17. Stand 13 has an opening for each shuttle-box and in line with each shuttle-box to receive plungers 18, one for each shuttle-box. The latter are independent of the shuttles and do not engage with them, but only with the shuttle-binders. Each plunger has connected with its inner end a spring-blade 19, which acts to move inwardly the plunger and hold it in engagement with the free end of the shuttle-binder and press inwardly said shuttle-binder against the shuttle so as to hold it in the shuttle-box. Each spring-blade 19 has its ends secured in recesses on the inner side of the stand 13, which prevents the turning of said spring-blade and also the turning of the plunger, each of which has an enlarged outer end or head 18′, which has vertically-extending beveled edges 18″.

In connection with the plungers 18 is used a stationary plate 20, forming a releasing device for the plungers and having two vertically-extending engaging portions 20′, which have beveled undercut portions adapted to extend under and engage the bevel-surfaces 18″ on the heads 18′ of the plungers 18. The releasing-plate 20 is supported on the upper offset end of an arm 21, (see Fig. 1), the hub of which, 21′, is loosely mounted on the outer end of the rock-shaft 11. The position of the releasing-plate is stationary relatively to the vertically-moving boxes and the plungers, carried on the stand 13, secured to said boxes, and is always in line with and engages the plunger of the shuttle-box in line with the raceway.

The operation of the new attachment is thus: As the shuttle-boxes move up and down the heads 18″ on the plungers 18 are engaged by the vertically-extending portions 20′ on the releasing-plate 20 and are moved outwardly and away from the binders 8 against the action of the springs 19 to release the action of the plungers on the binders. The plunger of the shuttle-box in line with the raceway of the lay carrying the active shuttle is always held out by the releasing-plate, so as not to press on the binder of said shuttle-box, but leave it in its normal condition to bear on the shuttle entering the box. The other three plungers,

not being moved out by the releasing-plate, are acted on by the springs 19 to press against the ends of the binders, 8, and press in said binders against the shuttles to hold the latter in their boxes. As the shuttle-boxes are raised or lowered, the plunger above or below the releasing-plate is brought into engagement therewith and the plunger moved outwardly to release the pressure thereof on the binder when the box is in line with raceway of the lay.

SELVAGE HEDDLE FOR DOBBY OR JACQUARD LOOMS.

The purpose of this heddle, as will be readily understood, is to be able to weave two or more fabrics, side by side, in one

Fig 1

loom, each fabric structure thus produced having its own selvages.

In order to be able to give a thorough description of the construction and operation of the new heddle, the accompanying five illustrations are given and of which Fig. 1 shows this new heddle in its perspective view. Fig. 2 shows an open shed with a selvage-forming thread on one side of the warp, Fig. 3 showing the same thread carried to the opposite side of the warp-threads. Fig. 4 shows a centre selvage in which two warp threads form part of the selvage and Fig. 5 is a similar view of the fabric, illustrating how more than two warp-threads form part of the selvage, i. e., how a wider selvage may be produced.

Referring more particularly to Figs. 2 and 3, numerals of reference indicate thus: 1, the warp beam; 2 and 3, a pair of warp threads; 4 and 5, its regular heddles; 6, the lay, and 7, the reed of the loom.

8 shows us a selvage-thread spool, from which the selvage thread, 9, passes under guide, 10, to and through the eye, 11, of the new selvage heddle, and in turn through the reed with the warp threads.

At the proper place, in the width of the warp, where a centre selvage has to be

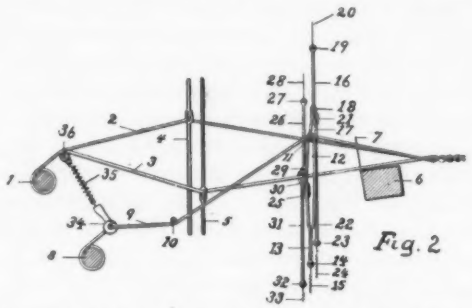


Fig. 2

formed, this selvage thread, 9, is started through the eye, 11, of the new selvage heddle, through the reed to the cloth beam of the loom. The selvage thread eye, 11, suppose is then at the upper end of the selvage heddle, as comprises the eye, 11, loop, 12, shank, 13, and eye, 14, all formed of a single piece of wire, the lower end of the

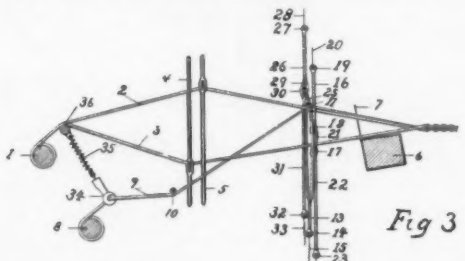


Fig 3

loop, 12, being a straight twisted shank portion, 13, ending in an eye, 14, that is connected to a retracting-spring, 15, so as to always pull the loop and selvage thread down below the shed.

On the right hand portion of the loop, 12 (that is, that portion of the loop to the right of eye, 11) there is a selvage thread lifter, comprising a twisted wire, 16, having a loop, 17, at its lower end, and just above this loop an open twist, 18, above which is the twisted

shank, 16, terminating in an eye, 19, to which is attached the harness cord, 20, going to the dobby or to the jacquard, according to what kind of shedding mechanism is used.

Through the open twist, 18, of the selvage thread lifter passes the loop, 21, of the selvage thread retractor, terminating in a downwardly extending twisted wire shank, 22, having an eye, 23, at its lower end, to which is attached a retracting spring, 24.

To the left hand side of the loop is attached a similar mechanism, but working oppositely to that of the right-hand mechanism just described, the same consisting of a loop, 25, at the lower end of the twisted wire shank, 26, having at its upper end an eye, 27, to which is attached a lifting harness cord, 28, connected to the dobby or jacquard respectively. Just above the loop, 25, is an open twist, 29, and into this takes a loop, 30, of a twisted wire shank, 31, terminating in an eye, 32, retracted by a spring, 33.

It will thus be seen that there are two selvage thread lifters operating alternately, one for each opening of the shed, as well as their retractors. 34 shows us a porcelain eye, it

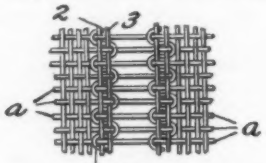


Fig. 4

being connected by the spring, 35, to the warp guide rod, 36.

The operation of the new heddle is thus:

At the time that the shed as shown in diagram Fig. 2 has been formed, the parts will be in the position shown in said illustration, the selvage thread, 9, being then on this side of the warp threads, 2 and 3. When, however, the shed is closed and opened in the opposite direction, the loop, 12, has been free to be pulled down by its spring, 15, upon the releasing of the harness cord, 20. When it then is in its lower most position and the shed is nearly completed, the cord, 28, is pulled, wire, 26, is raised, sliding along the left hand side of the loop, 12, to the eye, 11, and then lifting the loop, 12, to the other side of the two warp threads to the position shown in Fig. 3.

With reference to fabric sketch, Fig. 4, warp threads, 2 and 3, have a sinuous selvage thread, 9, passing below them, and through each convolution of the sinuous thread, 9,

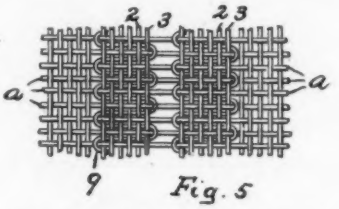


Fig. 5

passes a pick, a, said pick passing under the convolutions of the sinuous thread.

In Fig. 5 there are shown six warp threads embraced in each selvage, picks, a, passing under all of the convolutions of the sinuous selvage thread and the selvage thread passing under all of the warp threads back and forth between adjacent picks.

THE FINISHING OF FANCY CASSIMERES.

(Continued fr m September.)

If again a finisher should insist upon adding the flocks to the goods by the process known as half-dry and half-wet flocking, and when a rather excessive amount of flocks must be added to the fabric, and where it would take too long to apply the flocks by means of wet flocking, for the reason that the goods would have fulled up in width and length before all the flocks were applied. For this reason part of the flocks are given to the fabric in its dry state and the rest after the goods have been wet and become warm.

With reference to dry-flocking as first referred to, and which is the process most frequently used, the fabric after running from 15 to 20 minutes in the mill, as mentioned before, will have absorbed all the flocks given to it, and when the fabric then is ready for soaping, which (the soap) as mentioned before, must be of a good body.

After the goods have been properly soaped, and this with the right kind of soap, let the goods run until they begin to get warm, this being the starting point for the fulling, i. e., the felting, and

when they apply the traps of the mill, the latter affair, however, requiring practical experience. The fuller must use good judgment gained by practical experience by him, as to the proper amount of weight to apply in order to shrink the fabrics both in width and length, so that both items are accomplished simultaneously as we might say, for the fact that a fabric felted in this way is less liable to draw out or stretch than if done otherwise. After the fabrics have started fulling, i. e., felting in the mill, and have run for a while, pull them occasionally out of the mill, open them thoroughly. In cases where fabrics require fulling for considerable length of time, it may be a good plan to take them out of the mill and reverse them, and run them in that position until fulled up to width and length required.

After the fabrics are up to their width and length, they are then ready for washing, i. e., the scouring process, which as mentioned before, provided the right kind of soap has been used in fulling, i. e., the soap has been of good body, containing sufficient alkali to raise the grease, it then would be more of a rinsing process only, having for its object to get rid of all impurities as added to the yarn during dyeing, picking, and dressing of the warp. However, if the soap as used for fulling was of an inferior grade, has lost its vitality before fulling was finished, or just at this point, i. e., the soap having been of too light a body, then in this case a scouring soap or liquor has to be used in the washing process of the cloth in order to get the goods clean of the impurities previously referred to.

It is not necessary that the body of the liquor be heavy; quite the reverse, it is better to keep it light, and for which reason about one to one and one-half ounces of soap to the gallon water is sufficient. Again cheaper grades of soap may be used, for the fact that it is upon the strength of the liquor that reliance has to be placed, and for which reason the amount of alkali should be somewhat larger, than what is used in a fulling soap. The strength of the liquor, however, depends entirely upon the character and the condition of the goods. For example, if dealing with colors not fast to fulling, then it will not do to use too much alkali or else they may be injured. When the proper amount of ingredients has been well combined by boiling, the tank is filled up with water and left to cool. Just before the soap becomes cold, you may add to the mixture about one ounce of sal ammonia to the gallon, but if the alkali is ammoniated, one-half ounce will do. Stir frequently until well mixed.

Several pailfuls of this scouring liquor are given the goods, provided the lather does not show up good, i. e., the fulling soap has lost its vitality at the fulling, and after giving them 20 to 25 minutes in this, it is drawn off and the procedure repeated, and after that the goods are thoroughly rinsed.

Another important item for perfect washing is the kind of water to be used. The best to use is warm water, but unless this is plentiful at hand, cold water will have to do; however, there is nothing which will have as beneficial effect upon the goods at the washing, as a sufficient supply of lukewarm water. To always have an even temperature for the water is another item of importance.

After the fabrics to be scoured have been sewed, in a string, in the washer, the gates of the machine should be opened in order to allow the first dirty suds to run off; after which open the warm water valves part way, for from three to four minutes, then close them and allow the soap to raise for about five minutes, giving the goods in turn again warm water for from three to four minutes more. Shut water off again and thus allow soap to raise, and repeat procedure until soap raises to a nice clean lather, after which run them in warm water to thin the soap. After the body of the soap is rinsed off, give each piece one pail of sal soda liquor to test 2 1/2 degrees, in order to cut and raise any soap that may still remain in the goods. Afterwards run them in cold water for about thirty minutes so as to be positive that all impurities and soap have left the goods, i. e., that they are thoroughly rinsed.

If the fabrics are to be soured, take the goods out of the washer and fill the latter half full of cold water, add sulphuric acid for fancy woolen colors, or acetic acid if silk colors are used, until water tastes a little tart, after which put goods again in the washer and run them again in the liquor for

about six minutes, after which rinse them well in cold water. If goods are to be burr-dyed, do not sour. The pieces should now be extracted to take off the surplus water, but still be left wet enough to start water by wringing between the hands.

At the same time, the question may come up, is it advisable to full the goods in the grease or to scour them first? In answer to this we can only say that the object of scouring, as mentioned before, is to loosen and get rid of the dirt in the goods, and since grease and dirt, as in goods, will loosen in the fulling mill just as good, if not more readily, than in the washer, it seems to us that unless we have a special object in view, it would be useless to resort to two scourings which would be necessary provided we scour the goods previous to the fulling process first, and when one operation of scouring, i. e., fulling the goods in grease would accomplish the same result, the goods having to be scoured after the fulling process anyway, whether fulled in the grease or scoured first. The advantages claimed for fulling the goods after scouring them first are that in this way the amount of alkali used in the fulling soap can be or is reduced, a feature which in turn will prolong the time required for the fulling process, certainly resulting in turn in a finer felt to the fabric, a better surface to the cloth for the next finishing operations. However, since time means money, it will be readily understood that scouring goods previous to fulling can only be used satisfactory all around in connection with extra fine grades of cassimeres, i. e., scouring before fulling is not done in connection with medium and cheap goods and which certainly comprise the bulk of the fancy cassimeres in the market, since it would increase the cost of finishing them too much. Again these cassimeres do not depend upon felt for their finish, but quite the reverse, hence as a rule they are fulled in their grease, it being the natural way to handle these goods, furnishing the required conditions for a perfect foundation for its finish, with the possible exception, as previously alluded to, in connection with extra fine face finished fabrics, provided such should come under consideration.

One of the hardest things a finisher has to contend with is when changing from one stock to another stock, or what might be better explained, when changing from one mill to another mill, for the fact that the nature in combination of stock used in one mill will differ considerably with such as used by another mill, and that which might work well in one mill would be wrong in another mill, this being a point where experience on different grades of fabrics, gained in different mills, under different circumstances and conditions, will be the best guide, and when by watching a new grade of goods closely, the finisher will soon be able to determine the best plan to follow, with reference to fulling and scouring, as well as the succeeding processes.

The next process after scouring, in most instances, will be gigging or napping, a process which needs considerable care and pains to have it done well. Provided gigging is resorted to, always be careful to start with old work, run for about fifteen minutes, after which turn slats and reverse fabric, giving it in turn an additional run for about fifteen minutes, continue procedure using gradually slats containing stronger, i. e., less used teazels, on the last runs. If using the napper in place of the gig, the process will be simplified since the construction of the modern napper permits the operator to regulate the amount of application to a nicety.

If dealing with fabrics requiring burr dyeing, it will be found advisable to delay this procedure until after gigging or napping, as the case may be, since then any burrs, shives, specks, etc., and which may be in the body of the threads as constituting the fabric, are then uncovered, and in turn will come readily in contact with the burr dye, which, as a rule use from 2 1/2 to 3 degrees strong in connection with dark colors. Use about 1 1/2 pails of this burr dye to a piece 40 yards long and run fabric in liquor for about ten minutes, after which rinse for about one-half hour or less in cold water. Provided you find that fabrics thus treated, slightly rub off, i. e., crock, an application of two pails of salt water (one pail rock salt to 50 gallons of water) as a rule will overcome this trouble.

After burr dyeing extract goods thoroughly and dry them slightly above the required width, in order to remove any wrinkles, folds, etc., and when dry they should be put on gigs with old work, dry teasels, and given three runs to loosen fibres of nap, which will mat together in process of burr-dyeing and drying. After this, back-burl the fabrics so as to remove any knots or bunches that may be formed in fulling, etc., in order that no trouble (holes cut) at shearing. In the latter process set your revolver high enough so as to only take a light cut on first run, lowering the revolver, i. e., shear blades gradually three or four notches on the screws after each run. After you have lowered the revolver as far down as you can go without hurting the fabric texture, i. e., finish, give three runs at that point, and when the fabric should look fairly clear, showing up the threads full and round. Next run fabric over a specking table and fix up by hand any burrs, speck or other imperfection, after which give the fabric two or three runs on brush, and when pieces are ready for pressing. On a rotary press give the fabrics a moderately hard press, so that the back of piece will hold the pressing when face is steamed, also a little steam to the back of the piece before passing into cylinder, a feature which will assist to hold pressing on back of fabric. Next run on a roll and let stand until next day, after which steam fabric lightly and when it is ready for inspection, measuring and rolling, i. e., getting it ready for shipping to the market.

AN IMPROVED CONSTRUCTION OF A FILLING-FORK FOR SIDE STOP MOTIONS.

The objects aimed at in the construction of this new filling-fork, for use in connection with what are known as side stop motions, consist in providing strength, durability and effectiveness in action to the fork, besides resulting in a device which costs less to manufacture than similar filling-forks heretofore constructed.

The new fork is of a most simple construction, a feature readily explained by referring to the accompanying three illustrations and of which Fig. 1 shows us a blank, stamped from heavy sheet metal, which in turn is shaped in the body portion of the filling fork. Fig. 2 is a view looking at the underside of the fork, this illustration being

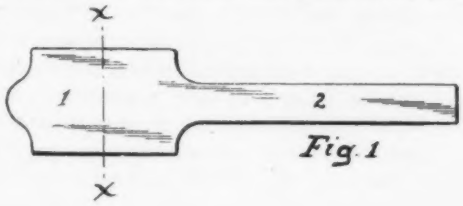


Fig. 1

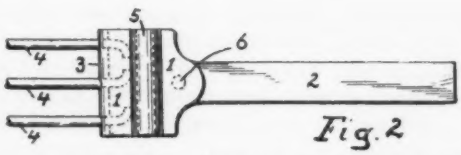


Fig. 2

more particularly given to show the manner in which the wire prongs or tines are inserted into, and in turn securely held in the body portion of the fork. Fig. 3 is a section, taken lengthwise through a complete fork.

With reference to its manufacture, the

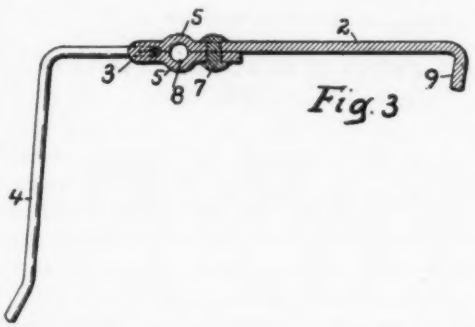


Fig. 3

body portion of the fork is stamped, flat, from heavy sheet metal—see Fig. 1,—after which its head portion, 1, and which is of a greater width than its shank portion, 2, is bent over at its centre (see dotted line x-x). Three holes are then drilled through the folded edge, 3, of the blank and a wire prong or tine, 4, inserted through each one of said holes, the prongs, 4, having curved inner ends (see Fig. 2) so as to be held securely in position in the head of the fork after the same has been securely locked.

A rounded bar is then placed transversely between the folded body portions of the fork and the whole placed in a die, so as to form the transverse hub, 5, at the same time em-

bedding the curved ends of the wire tines, 4, in the head portion of the fork.

The fork is then removed from the die, and when the folded head portion will naturally spring sufficiently apart to permit the easy removal of the bar previously inserted.

A hole, 6, is then drilled through both sections of the metal, a rivet, 7, inserted, and both sections then securely riveted together, as clearly shown in connection with Fig. 3, in turn forming the hole, 8, and by means of which the filling fork later on is adjusted, in the stop motion proper, in the loom.

The end of shank, 2, is then formed in its characteristic hook, 9, and the wire prongs or tines, 4, bent into its proper L-shaped form, both features being clearly shown in connection with illustration, Fig. 3.

Using wire prongs or tines in connection with a filling fork eliminates any wear (cutting) on the filling, and using heavy sheet metal for the shank of the fork in turn provides a strong and durable hook, 9, to securely withstand the blow of the filling-hammer of the stop motion.

TWIST IN DRAWING IN COTTON SPINNING.

The most important process, i. e., the fundamental element of proper cotton spinning is proper drawing, the process as practiced in all the different sub-divisions in cotton spinning, being the means by which the entangled mass of fibres in the sliver, as coming from the card, are arranged gradually in parallel order, i. e., resting side by side, after which the insertion of twist completes the thread.

The count of the thread, i. e., its diameter, depends upon the amount of drawing the fibres have been subjected to, i. e., the greater the amount of drawing done, the finer the count of the resultant slubbing, roving or thread, and consequently the less the amount of drawing practiced, the heavier in count said resultant slubbing, roving or drawing will remain; the process itself being accomplished by means of passing the sliver between several pairs of leather covered rolls, or in connection with some of the sub-processes, between such as are known as metallic drawing rolls, every successive pair of rolls having a greater surface velocity than the preceding pair.

With reference to the direction of twist to insert into the yarn, i. e., whether left or right hand twist to insert, differences on this subject exist among cotton spinners, possibly on account of the simplicity of the operation, although underlying the same are found all the elements necessary to account for such differences of opinion. For instance, spinners who have made what is termed reverse twisted warp yarn will have noticed that the same does not spin as well as regular twist warp yarn, although the counts of yarn, the cotton and machinery used are identical. It would seem that in order to produce this kind of yarn all that would be necessary is to reverse the spindle bands of the mule or ring frame, as the case may be. This reversing of bands however will not result in an equal amount of twist for either right or left twist.

Some spinners may claim that this difference in twist, in connection with mule spinning is due to the bands, which, if they have been working for a considerable time in the warp twist direction, do not work so well when reversed. However it may be noticed that new bands will make but slight, if any, difference.

With reference to ring spinning, the claims brought up by the spinner again may be, that besides the similar trouble with bands, as stated before in connection with the mule, the right hand thread wires interfere with the balloons or that the travelers do not run so freely when reversed, on account of their ends having been worn angular, again that a traveler moves in a different track on the ring when running the filling way to that it runs in when turning in the warp direction, and, therefore, the ring offers more resistance to the traveler.

As a rule, when required to spin quantities of warp yarn with filling direction for twist, it is customary to renew the spindle bands and travelers, also to put on filling way thread wires. These alterations, although giving slightly better results, there still will be found some difference in the spinning, and the only reason left to account for is, as

mentioned before, that a traveler moves in a different track on the ring when running the filling way to that it runs in when turning in the warp direction, and that consequently the ring offers more resistance to the traveler.

It will be noticed that warp yarn twisted warp ways, conditions alike, will be stronger than warp yarn twisted filling ways, some spinners claiming for it that the natural convolutions of the fibres are chiefly in the direction of warp twist, hence better spinning qualities for yarn spun in that direction (?), others, that the filling way twisted warp yarn contains actually less twist than warp way twisted yarn.

Some spinners contend that the drawing rollers of the ring frame or the mule take out the whole or a portion of the previously imparted twist from the roving, a feature which, however is not the case, since the interposition of the fibres in the roving prevents during the spinning operation any escape of twist worth while considering.

The best results in cotton spinning are obtained with roving twisted to the maximum extent (without interrupting proper drawing) in the same direction as the twist put in the yarn, by the mule or ring frame, as the case may be.

Imperfect piecings are trouble to perfect drawing, since on account of extra twist thus imparted to the roving, they form hard places, for which reason, see that the fly frame tenders only make perfect piecings by placing the tapered ends so that they overlap, and then twisting them carefully between the first finger and thumb. This consolidation of the fibres no matter how perfectly done, in turn makes this place in the roving draw always more difficult, and more so if done imperfect, i. e., overtwisted, or as some frame tenders do, wet it with saliva before twisting, never thinking what trouble they thus make.

If the rollers refuse to draw a piecing, it is then a sign of too much twist used by the tender in consolidating the broken ends.

In the processes preceding the roving or fine frame, provided the latter is used, twist to the sliver, slubbing or roving is of less importance, hence a more moderate twist is recommended in the intermediate, less again in the slubber, and still less in the sliver. At the same time it must be remembered that it tends to produce a more regular roving, and stronger and more lustrous yarn, when care is taken in seeing that twist is never so much as to interfere with the work of the rollers, for which reason the general rule laid down is to put in as little twist as possible in the roving through all its stages, i. e., only sufficient to prevent the fibres from being displaced until reaching the rollers of the successive machine, i. e., only holding the fibres compact until they reach a point where reduction in size of sliver occurs and when the twist instantly passes to the reduced point.

With reference to spinning dyed cotton, the twist has also an important influence upon the tension of the rovings. Some carders in order to be able to crowd a large amount of roving on a bobbin, for this reason crowd a great tension upon the ends; which, if there is much twist in the roving may pass, but, if not enough twist is used, notching of the roving is unavoidable, with the result that slacker twisted yarns are spun.

Before a roving is run off, it must be wound on, and here it is that trouble takes place in stretching. As little tension and twist as possible are necessary to overcome evil, hard twist injures the drawing and spoils the rollers. Some may say that the rollers can be set farther apart so as to allow for this extra twist, but the result will be a disappointment. Difference in tension may be corrected by the number of wrappings of the roving around the flyer leg. Always have an equal amount of weight on your top rolls, also see that the saddle is true, i. e., does not touch the side of the back rollers. If, on account of the dyestuff in the material, lapping or sticking takes place, then in place of increasing the tension, use whitening. Be careful to keep all gearing as well as the differential thoroughly clean and well lubricated, so as to give an easy drag.

Belgium is the most thickly peopled country in the world, with a population of 622 to a square mile; Russia is the least, with only 15 people to a square mile.

CORRESPONDENCE AND NOTES

Upon Textile Topics At Home and Abroad.

AN ORDER BOOK FOR A WOOLEN MILL.

BY EDWARD ARNOLD.

The books required for a worsted or woolen mill depend on the variety of goods made, the size and equipment of the mill. A short time ago I had the pleasure of meeting a selling agent who boasted that one of his mills had made the same fabric summer and winter for thirty-four years. Another manufacturer said his father ran his mill four years on one fabric and one pattern. Today a mill of this kind would be hard to find.

Different mills have different systems, but all are working for the same result, namely, prompt deliveries. For this there must be some kind of a system. Keeping track of the orders in a mill of 100 looms making woolens and worsteds and having eight to twelve fabrics ranging from 80 cents to $2.00 per yard, will involve more detail than in a mill making but one or two plain fabrics.

The first book is for the orders and the time of delivery. The form shown at Fig. 1 in a loose leaf book will be found very convenient. There are always several styles that do not sell and others that sell in varying quantities, sometimes necessitating several pages to book the orders and deliveries for one pattern. By using a loose leaf book leaves can be put in at will and all the styles brought in consecutive order.

At the top of the page enter the number of ends in warp, reed, width, and picks; at the right hand corner enter the style and pattern number. The first space is for warp and filling, giving the number of ends of each shade in warp, the size of the yarn, and weight in pounds required for one cut of warp based on 56 yards dressed, plus 10 per cent. for waste in winding, spooling, dressing, etc. Next follows the length of filling with shade and size for one yard, also weight of each shade required for a cut based on 54 yards woven. Ten per cent. is allowed for waste. As the fabric is 64 inches wide inside the selvage it is customary to add two inches for selvage in figuring weight of filling required for one cut.

These sheets are made up by the designer or his assistant and should be examined carefully to see that the colors are entered properly. They are then ready for the daily orders to be entered.

The second column is for the order number; the third, for the total pieces ordered; the fourth, for the cancellation number; the fifth, for the number of pieces cancelled. By keeping the order and cancellation numbers the number of pieces claimed to have been ordered on a style can readily be verified.

The next eight columns are for entering the number of pieces to be delivered each month as specified by the buyer. The next column is for seconds made, if any, as they will have to be replaced with new goods. The next column marked "Ordered Dressed" should be filled in as the work is laid out and orders placed on the dressing book for dressing a given number of pieces of a certain style. By having a daily report from the dressing, weaving, and finishing rooms, the number of pieces from each department can be entered daily in the proper columns. At a glance one can tell the number of pieces ordered, ordered dressed, dressed, woven, and finished, by the figures in pencil at the foot of each column; the totals will be changed each day as the pieces go through the different departments. By having the orders and monthly deliveries entered the goods can be laid out for the earliest deliveries first. Small warps should not be made as it is more economical to carry two or three pieces a few weeks than to go to the extra expense of making two or three cut warps.

A leaf 12 inches by 16 inches is convenient.

STYLE 800-1

3840 Ends 15 x 4 Reed 64 in. 64 Picks

STOCK		ORDER NO	PCS.	CANCELLED ORDER NO.	CANCELLED PCS.	DELIVERIES AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	SECONDS	ORDERED DRESSED	DRESSED	WOVEN	FINISHED
Warp	Wt.	28	10			2		2	2	4					10	IIII III	IIII	II
1920 Blk 2/30	14	37	3			1	2											
960 #5 Mix.	7	39	2			1	1											
960 #9 " "	7	52	20	14	10	2				8								
3840 Ends		90	12			1		3			8							
Filling	Wt																	
2112 Blk 2/30	14.92																	
2112 #12 Mix.	14.92																	
4224 yds																		
			47		10										10	10	4	2

FIG. 1.

The form given is for a light weight season. Note order No. 52 for 20 pieces; 2 pieces in August, 8 pieces in December, 10 pieces in February. Later cancellation No. 14 for 10 pieces February delivery is received on order No. 52. This cancellation is entered opposite in red ink and a line is drawn through the 10 in February column, denoting that it is cancelled.

THE COST OF WOOLEN GOODS.

The author of the article published in our August and September issues under the heading given above is Rudolph Koerner, Oregon City, Oregon, the name Edwin Viles under which it appeared being a nom-de-plume.

SPOOLING AND DRESSING WOOLEN YARNS.

BY MILO BLAIR.

The reeling and spooling of woolen and worsted yarns requires very careful attention in order that they may reach the dressing room in a proper condition for good production and quality. Many of the imperfections that are found in finished cloth can be traced back to the spooling room, where some careless overseer or some untrained machine hand is either directly or indirectly responsible. In most cases we can lay the blame directly to the overseer, for I have yet to find the reeler or spooler tender who after once having been properly trained, will wilfully or otherwise make poor work.

Many overseers make the mistake of starting "learners" on a machine before they are capable of operating it. As often happens, it is impossible for them to procure skilled help and they are obliged to employ a number of "green hands" and teach them to operate the machines. If an overseer is pushed for more production from the spoolers he will very often give these green hands a trial for themselves before they are thoroughly taught, with the result that a lot of poorly spooled yarn is returned from the dressing room. Instead of having the second hand or some other responsible person to watch the learners he gives them a set of yarn and tells them to go ahead. If they happen to be spooling yarn of which there is already some ahead of the dressers they will make ten or fifteen spools before the bad work is discovered by the dresser. This means two or three days' work for the overseer and all other spare help that can be found, rewinding the spools, taking out double ends, filling holes, straightening crossed ends, and a number of other defects that only a poor spooler can cause.

Each room in the mill in order to run successfully should have some system by which poor work can be traced back to the person or persons responsible for it. If the spooler is receiving poor work from the reelers, there should be some way to know from whom it comes besides guessing, which at its best is a very poor way to fix the responsibility and is not fair or just to the employee.

A good system which is used in a number of mills at the present time is to have each side of the reeling machines numbered and the reeler tender known by the number of the side on which she works. Then all full spools that come from this machine are marked with chalk, the same number on each head. The spools can then be emptied into bins or boxes or any place that will be convenient for the spoolers. In this way each "tender" in the room has a different number and if the spooler now receives poorly reeled yarn he gives the spool to the overseer, who can at once tell who is responsible for the poor work.

This system is used with but very little change when spooling woolen yarn from "jack bobbins," and is also used to keep the different lots of yarn separate. The spinners are divided into sets of three; the first set are provided with red chalk, the next set have blue and the other white and so on until each set of three spinners has a different color of chalk. Then John Brown, for example, who is in set number one and who has red chalk, makes one red ring around the yarn on the bottom of all bobbins that come from his machine. John Smith, who is in the same set, makes two red rings on all yarn spun by him and Tom Green, the third man in the same set, makes three red

rings on all of his yarn and so on with each color and set until each spinner has his own color and number of rings marked differently from any of the rest. It is a very easy matter to mark the rings by holding the chalk lightly against the bobbin while the mule is in motion.

After we once have the reelers making good work we can take a step farther to the spooling room. There are so many things that seem to be mere trifles here but which cause serious troubles in the dressing room, that it will be well to mention some of them before going farther. One of the worst troubles that a dresser has to contend with is to have the yarn running slack from one end of the spool while the other end is so tight that it is on the point of breaking. The slack ends hang so loosely that they become tangled and twisted with the yarn running from the spools below them, with the result that there are ten or a dozen ends broken before the machine can be stopped, thereby making poor work for the weavers as well as curtailing production in the dressing room. This is caused in spooling by the rolls that have either become worn or were not evenly turned when made. When the yarn passes through these rolls there should be the same amount of pressure on each thread. If there is any part of the rolls that is worn or uneven the yarn will run through more freely in spots and consequently will wind on the spool more loosely than that which comes from the rolls tight. Another cause for the same trouble is when the rolls are run with weights on both ends, for the purpose of increasing the pressure on the yarn. Often one of the weights drops off unnoticed or one weight may be heavier than the other; the side that has the heavier weight holds the yarn tight as it passes through, and also has a tendency to raise the top roll at the opposite end, thus allowing the yarn to run through freely as already explained. Double ends and holes in the spool are also a great annoyance to the dresser and are usually caused by carelessness on the part of the spooler. Many spoolers when they notice a double end on the spool either tie the single end to it or simply lap it around the spool, which is not the proper thing to do. When this end comes to the dresser fixed in this way it runs off the spool, leaving an end out and also making it a "tie back" for the weaver; or if it is tied it will draw the "double end" through the reed after it, making a double or "coarse" end which will show plainly in the finished cloth.

A good way to fix a double end or hole is to lap the end around the spool, then after running twenty-five or thirty yards mark the thread which has covered the double end or hole with white chalk for the width that the guide vibrates the thread, which is about one-half inch. When this white mark is seen by the dresser, he knows it is a signal for something that is coming after it, and if he is a good, careful workman it will not get by him once in twenty times. He can then tie on a bobbin until the hole is even with the rest of the spool or until the double end runs out.

Another important matter is to have the guide set properly before starting a new lot of yarn, especially if there is a difference in the count of the new and old lots. If the guide is not set properly and it vibrates the yarn too much, it will be impossible to split the spool. Should a thread break and the dresser not notice the break at once, the threads on each side of the broken one will also break and it is quite difficult to have these threads running properly again while the spool is in use. In case the guide does not vibrate far enough, soft places occur between each thread into which the threads fall when running, drawing very tight and soon breaking. When the majority of the threads have fallen into these soft places, those that are still on the surface of the spool hang so loosely that the yarn becomes tangled and twisted at the reed, and it is impossible to make any further progress. I have seen yarn in this condition that had to be cut off the spools and thrown into the waste bag as no amount of patience or work would make them wind off.

In a spooling room where fine worsted and cotton yarns are spooled from reeler spools there should be certain spoolers very lightly equipped for this grade of work with very light rolls, reeler spools as light as can

be found and having no ropes or rods for the yarn to run over or anything that would cause strain or friction on the yarn. It is also well to have a handle attached to the drum pulley for the purpose of starting the spooler slowly by hand previous to shifting on the belt. Last but very important is to have moderate speed as there is nothing gained by having fast speed on a worsted spooler. When on slow speed the machine will turn off more work. When running faster the spooler runs for a short time and is then idle twice as long while the tender is tying broken threads. This can be also said of spun silk, which is quite difficult to dress if not handled properly in the spooling room. Many mills run all silk from three and one-half inch spools, sometimes running as many as seventy-five at one time as they say they find from past experience that silk will not run from forty-inch jack spools. If they would only give a little more attention to the setting of the guide and the proper weighting of the rolls they would have no trouble whatever. I have seen running from jack spools as many as one hundred and twenty ends of 60/2 silk in a section; running perfectly while dressing and having an evener appearance in the finished cloth than when run from three and one-half inch spools. This was on high pick work fancy worsteds. I have also seen silk run in this way from 28/2 to 70/2 silk on both high and low pick work with the same result.

After the spooler has received a set of yarn and has it "tied in" ready to start, she should notify the overseer or second hand, who will watch the yarn as it winds on the spool in order to see if it is streaky or if the guide vibrates properly or if the ends have the same amount of tension across the spool. If all is satisfactory he then gives the spooler the spool tickets, one for each spool of yarn that will be in the lot when all is spooled, with the date, lot number, count, grade, color, weight and the spooler's name on each, one to be put on each spool when full. The yarn is now ready for the dressing room to be made into warps.

After we have received the dressing draft and warp ticket from the overseer with full instructions as to the colors, number of ends cuts, sections, etc., we are then ready to proceed with the picking of the pattern. In case there is a warp dressing, we must stop the machine one round, or about four yards short of the full warp, which is usually the distance between the reel and where we tie in the new pattern. If the new section is not more than a hundred threads less, it is always well to stop short also, and when tying in the pattern we can also tie the threads that have been left out from the previous pattern. The knots are then run through the reeds to the reel which makes the warp full and we have saved the four yards of yarn, which will more than repay us for the time lost in tying the extra threads.

Before picking the pattern we should decide which colors to run from the top and which from the bottom. Usually it is best to run the black or darker colors from the top, the "broken spools" (spools of which only part of the threads are running), if any, from the centre and the lightest colors from the bottom. By running them in this order it gives a better chance to watch the broken spools. These always cause more trouble than the full spools because they must be tied over often in order to have them level at the end of the warp. The reason for running the lightest colors at the bottom is, that they make a lighter under ground for the darker colors above, thereby making it easier for the dresser to see the threads at the pattern reed. Having picked the pattern, the next in order is to pick the spools, being careful to pick the threads uniformly across the section. Many dressers when running broken spools run the ends on one side of the section only. This is a very bad practice for the reason that if there is any difference in the lots of yarn or if the friction is either tight or loose it will cause light or dark streaks in each section through the warp, making unmerchantable cloth which must be sold as seconds with a heavy loss. When the spools are picked and arranged in the rack, we are then ready to tie in, run the knots through the reeds and beam off.

After the warp is beamed we can then pin the reel. To find the width of the different sections, divide the width of the warp by the number of sections, allowing for the listing

according to the count of yarn used. For example: A warp is composed of 4320 ends, 9 sections 480 ends in each, 72 inches in width, selvage 80 ends (40 to each side) the same count as the warp. Without the selvage there would be an even eight inches to each section of 480 ends, as $72 \div 9 = 8$. In this case we allow 1 4/8 inches for selvage, leaving 70 4/8 inches for warp alone. One-ninth of 70 4/8 inches is equal to 7 6/8 with a remainder of 6/8 inch; 1/8 is to be added to each of the six sections of the warp which will make the width of the different sections as follows:

6 sections width 7 7/8 in.	= 47 2/8 in.
3 sections width 7 6/8 in.	= 23 2/8 in.
For each selvage 6/8 in.	= 1 4/8 in.
9 sections. Warp and selvage	72 in.

On narrow goods where there is sufficient room left on the beam to extend the flanges, the sections are not figured in this way but the same allowance is made for each section, also allowing extra for the selvage. If the warp is then over the required width on the reel the flanges of the beam are set to fit the warp. In mills where the full width of the beam is required this cannot be done as the flanges are set as wide as possible at first and always remain in that position. In cases of this kind the reel must be set to fit the beam as already explained.

We can now reed our section in the "neck reed" which is done by finding the width of the widest section between the pins, then reeding the threads accordingly. For example: Our widest section between the pins in this warp is 7 6/8 inches. The neck reed has nine dents to the inch and the section is to be 7 6/8 inches. $7\ 6/8 \times 9 = 69\ 6/8$ dents or 70 dents. We now have 480 threads to be divided equally into 70 dents which gives us $480 \div 70 = 6$, and a remainder of 60 threads. One thread is added in each of the sixty dents across the section, making sixty dents with seven threads and ten dents with six threads. To reed the threads uniformly the arrangement is 7, 7, 7, 7, 7, 7, 6, or one dent with six threads to every six dents with seven threads. This gives a trifle more than the exact width, but it is better to reed the section a trifle less than the required width. Some grades of cotton yarn will beam much better with the section one dent or about one-eighth of an inch less than the required width, while a soft, spongy worsted yarn would require as much as three dents or about three-eighths of an inch less. The dresser, however, must use his own judgment in this, and the warp when beaming is a good telltale to show whether he has used it to good advantage or not.

We can now fasten the section to the reel and after taking the lease and setting the clock our pattern is ready for the overseer to look it over in order to see if we have the correct colors, number of ends and sections, and to see if everything is right. If he pronounces it O. K. we are then ready to start dressing.

While dressing the first section it is always well to put in the cut marks. Then if we are not able to finish the warp the day we start, we are not in doubt the next morning whether we have our cut marks in. We should also decide while dressing this section when to change our broken spools in order to have them level at the finish of the warp and have it marked in some conspicuous place so that we will not run over.

In building the section care should be taken not to crowd the yarn against the pins. Otherwise it will cause the yarn to roll and break when beaming. The threads will then remain on the reel instead of running off, causing run arounds forty or fifty yards long, which are all threads out for the weaver. Many otherwise well dressed warps are often spoiled in this way.

If the yarn is sized care must be taken to build the section even with the rest of the warp as a high or low section is a very serious matter and causes much trouble. The tension must be equal on the yarn at all times. This is accomplished by adjusting the pressure on the rolls or adjusting the reel belts to make the reel take the yarn faster or slower as the case may require.

When beaming care must be taken to avoid excessive friction on the reel as this often strains the yarn. While these threads may not break on the dresser they snap at the "whip roll" weaving, and the weaver loses time and money on account of the dresser's poor judgment.

ENGLISH NOTES.

(By Our Special Correspondent.)

Stories of tree-cotton and other professed substitutes for boll-cotton, coming from outlandish sources remind one that Lancashire grows a "cotton" of its own. Eriophorum vaginatum, called commonly cotton grass, is no true grass but a sedge. It flourishes on the peat bogs and mosses which crown the mountainous backbone of Northern England and is found chiefly between 1,000 and 2,000 feet above sea-level. In July or so the rush bursts forth its filaments, which are silver-gray in color, bright and lustrous, and measuring from 1 to 1 1/2 inches. Many a time it has been said that cotton-grass was to be commercially exploited and were it less brittle in nature its textile use might be possible. But the fibre has no resistance and no elasticity and even for stuffing cushions it would not supplant the East Indian Kapok or "thistle-down." Specimens gathered within a mile or two of Oldham accompany this article.

* * *

One reason why female help is scarce now in the Yorkshire woolen area is that girls prefer to sew or knit rather than to weave or spin. Employment in the making-up business is probably more precarious. Every season sees large changes in the staff, but work on light machinery is preferred where it is locally obtainable. Trade has taken on one of its expansions and in Huddersfield there is a dearth also of men. More might be had for paying for them, but it is the case that men's wages in the woolen trade—saving exceptions—are not enough to attract recruits from other walks of life. Rather more parents are reluctant to send children into mills and in places the shortage is acutely felt. In busy times previously some of our manufacturers have fished in the agricultural districts for families of workers. The father is made a carter or inside-laborer and all the boys and girls go into the mill. Occasions for transplantation have not been numerous or regular for some years and a cause of some friction with operatives is the practice of making a whole family suffer for the delinquencies of some one of its members.

No very obvious connection is apparent between dusty roads and prices for dyeing, but these two items promise to come into relation. Coal-tar—the basis of nearly all our dyestuffs—is at present cheap. It fetches only its fuel-value or barely more than ruled before the great discovery that New York celebrates in October. Local authorities are looking to applications of tar to rid the roads of the dust that the automobiles scatter so profusely behind them. Recognizing this, some of the largest tar producers are planning to sell all the tar they can for road-making at about a penny a gallon and thus to create a stringency that will cause color-makers to pay the threepence or fourpence they did in the early days of the aniline dye industry. In other words they mean to double the price of tar if circumstances favor, and this could hardly be done without effect on the prices of German and British dyes. The position of tar as a layer of dust is not unassailable and it is not certain that the feat proposed can be performed quickly.

* * *

Though Americans are temporarily out of the market for silk noils some Huddersfield and other woolen spinners are consuming still. Prices of the regular English type are half of what they were, ninepence instead of eighteenpence. Even this level is considerably higher than was touched five years ago when the same material realized only 3 1/2 pence. Merchants do not anticipate, however, any relapse to those depths and not while darker material of the Continental schappe type continues in its present demand.

* * *

The factory money-lender is a creature who now receives a little unwelcome prominence in Yorkshire. He is an operative more saving in disposition than his mates. He lends out shillings to fellow workmen at the rate of 8 1/3 per cent. per week—the equivalent of 433 per cent. per annum. But as his dealings are from Wednesday to Saturday, or so, and are for small sums, his "victims" dispense with calculations and express surprise that anyone should think the bargain onerous. The worst consequences of this money-

mongering follow when the little Shylock of the mill gets his foreman into his debt. It has been my own luck to know men who "couldn't be sacked," others who were never likely to be, so long as their groceries came from the store kept by the superior's wife. To avoid favoritism of the latter kind some of our railway companies very rigidly forbid their employes or employes' wives to open stores.

* * *

Although aniline dyes are prohibited from entering Persia it is not sure that none are used in that country. Various articles of prohibited or heavily dutiable classes are landed on the Arabian coast and are furtively transferred to Persia in small craft. What can be done with coffee might be done with dyes, and it is observable that though a population of 12,000 drank coffee all day long during last year only two tons of coffee paid duty. Anilines are mentioned specifically as smugglers' articles in a British Consular report from the port of Lingah. Persian dyers, too, in the times when the use of anilines was permissive accustomed themselves to their employment.

* * *

The irregularity of rates of wages in one industry carried on in more than one district is always a disturbing factor. Uniformity is hard to maintain and in various trades standard lists allow for 5 per cent. or so less in so-called country districts. It is so in dyeing for the Bradford market and the apologies for the arrangement are that living costs less outside the cities and that country dyers are involved in greater costs of carriage on goods than town dye works are. On the other hand rents and rates are easier in the country and unless water were cheaper the works would not be occupied. These advantages offset handsomely the cost of cartage (which is done usually by contract) and both employers and employes are coming to look on the country wage system as a needless weakness.

* * *

Cotton culture in Gambia is a confessed failure with which the British Cotton Growing Association is not proceeding. Three years of experiment have cost the Colonial Government $7,500, the Association $2,500 and the native planters a sum that is not ascertained. One penny a pound was all the Association could pay for seed, whereas growers could sell it to neighbors at threepence. Then between 250 and 300 pounds per acre was the best yield obtainable even in the absence of drought and weevils. At a penny a pound the fruits to the farmer were $6.00 per acre. Ground-nuts, which are produced with less trouble, net $18.00 per acre. And—in the words of the Colonial Secretary—"the native is a very shrewd fellow."

In the Gold Coast Colony the cotton farm at Anum has been given up in favor of one of 200 acres on richer soil at Labolabo. Here a hybridized American plant is giving about 1,200 pounds of seed per acre and the Colonial Government is financing the Association up to a limit of $7,500 per annum. About $17,000 were spent on this farm in eighteen months ending December last.

* * *

In this country every mill, like every ship, has its own name which is not necessarily identified with the name of its occupants. Often, mill-names are derived from the localities, but often they are purely fanciful in origin. It is interesting to see in which direction the imagination of their owners and builders lay and easy to see from frequent recurrences that their sense of fitness had its limits. "Temperance" or "Commercial" mills are to be counted by dozens, and "Providence" and "Perseverance" by scores. "Victoria" and "Albert" mills are everywhere, and "Prospect" mill is a name of immense popularity. "Phoenix" mills that have arisen from ashes are beyond counting and quite enough take their names from Trafalgar or Waterloo. Cotton spinners have shown less poverty of invention and that they have had an eye for the soul of wit, these names show: "Vine," "Bee," "Sun," "Star," "Rock," "Lion," "Owl," "Ruby" and "Pearl." These are less cumbrous than certain American names of Indian origin and—which is more to the practical point—they can very easily be printed and read upon cases, bobbins, skips or other mill property.

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In the smaller worsted mills it is not un-

common to find the parts of salesman and designer doubled in one person. A man is engaged to "get-up and sell his own styles" and this he has to do literally, although in establishments slightly larger the getting-up means little more than supplying directions to a designer. Where a designer is maintained as such and not also as a salesman he is not always sent into the market. There are firms whose designer is forever doomed to receive his impressions at second-hand and others who send their man to the London office regularly each season to brush against customers for a few days or weeks. In importance, if not in numbers, the latter class probably predominate and something is to be said in favor of their method. The man who has pondered over each intimate detail of a style, and has juggled the colorings and arrangements, is able to point not only to the advantages in them, but to the unapparent disadvantages in some alteration suggested. Then a customer's criticisms or opinions are not always clear or detailed and it is quite possible that a hint will convey more to the designer's ear than to a third party's. Eleventh-hour alterations are perhaps of less consequence than the opportunity obtained for shaping ideas for the season to follow. Besides, there is the undoubted fact that some customers like to talk with the technical man for their own satisfaction. The designer absorbs a clearer notion of the current of events and insomuch ought to be the more useful to the mill. However, we have always those who are opposed to allowing any employe to know too much, and among them and the others who fear the expense, must be sought those who persistently keep their technical man in the twilight.

Of the total foreign trade of the United States, estimated at over 60 million tons, only about 10 per cent. in value is carried in vessels belonging to the United States.

Canada has over 20,000 miles of railway and the railway mileage per head of population is greater than that of any other country. It has more railways than all the South American countries together.

THE SIZING OF COTTON YARN.

BY F. SCARISBRICK.

(A paper read before the British Association of Managers of Textile Works.)

(Continued from September.)

SOFTENERS.

In order to increase the pliability of the sized yarn it is essential to use some substance of an oily or greasy nature, or something in the nature of wax. The most important substance for this purpose is tallow. Experience has shown that for all-round work there is no other substance that will give better results than pure beef or mutton tallow. Attempts innumerable have been made to bring out some substitute which would give equal results at a less price. So far they have all failed, and manufacturers would be acting in their own interests if they left these substitutes severely alone.

Although tallow is the best substance to use as a softener, it is necessary to be careful in purchasing this article, as it is without question the most adulterated article offered to sizers. Mr. Percy Bean tells me that the average number of adulterated samples of tallow passing through his laboratory is three in every ten samples. In many cases the adulterants used are not injurious substances for sizing—I mean when such substances as bone fat or marrow fats are mixed with the genuine article. The main objection to these substances is that they should not be sold at the market price of tallow. On the other hand, tallow is being largely adulterated with mineral oil and Yorkshire grease. Mineral oil in particular is objectionable, as it vaporizes at a low temperature, and a great portion of it is lost in the boiling operations involved in making the size, and another portion is lost when the size is boiling in the sow box of the tape frame. There is a great danger of cloth which has to be bleached being damaged in this process if mineral oil be present. Mineral oil is a most objectionable thing to have in goods for bleaching, and I have no hesitation is stating that most of the unfathomable damages from stains in bleaching are due to the manufacturer of the cloth having unknowingly used an adulter-

ated tallow. The use of such adulterated tallow is just as objectionable for goods which have to be dyed, and many cases of damage are traceable to this cause.

Yorkshire grease is just as objectionable. This substance generally contains a large quantity of unsaponifiable matter, and this cannot be removed from the cloth in the bleaching operations.

If tallow of good quality is always used, there is nothing to equal it for heavy sizing, or any form of sizing where chloride of magnesium or chloride of zinc are ingredients of the size. It is quite impossible to obtain better results with soap of any description. The softening value of a soap is proportionate to the amount of combined fatty matter, and this amounts to only from 60 to 65 per cent. in a really good hard soap. In soaps especially sold for sizing purposes the fatty matter is usually very small in proportion to the amount of water sent in the same cask. It needs only a little investigation to prove that it is cheaper to buy fatty matter in the form of good tallow. Some expense must of necessity be entailed by the manufacturer of tallow substitutes in the process of converting the added water into a solid, by means of a little common fat and alkali, to say nothing of the profit and the extra carriage on the solidified water.

There may be cases where sizers who ferment their flour may find some advantage in using soap. This is due to the soap containing a little free alkali, which has the effect of neutralizing a portion of the acids generated in the process of fermentation.

A cheaper and far more efficient method of neutralizing the acids would be to use a small quantity of caustic soda, and at a minimum cost obtain the maximum results. Using soap to neutralize free acid is on a par with the method employed by the Chinaman in one of Charles Lamb's "Essays of Elia." He had found out after his house was burnt down and his pig was roasted to death, that roast pork was good, and in future when he wanted roast pig he burnt a house down with a pig inside.

Waxes and oils are also used for softening purposes. Paraffin wax may be used to advantage in certain classes of cloth, but never for goods which have to be bleached and dyed.

Spermaceti is fairly extensively used as a softener in some districts, but why such a substance is employed is more than I can say. In the first place, it is far too expensive a substance to employ for such a purpose, and in the second place it is generally used in conjunction with tallow or paraffin wax, but in so small a proportion to the total quantity of size present that any properties it may possess are lost. The use of spermaceti is merely a superstition, and its qualities can be equaled by the use of tallow or paraffin wax, or a mixture of the two.

In pure sizing oleine oil might be successfully employed as a softener in sizing. It is soluble in water, and consequently is easily incorporated with the size. It possesses softening properties to a marked degree, and mixes better than any other softener with dextrine. This substance must not be used where chloride of zinc or chloride of magnesium are ingredients of the size.

WEIGHT GIVERS.

China clay is invariably used for weighting sized shirtings. Its low cost combined with good color and smoothness of "feel," make it an ideal substance for this purpose.

China clays vary to a great extent in their physical properties, and it is necessary to use care in the selection of a sample for sizing purposes. Some clays produce a very thin mixture when a small amount of water is added, while other samples produce a thick mixture. My experience shows that the clays which produce the thickest mixture are the best for good results in the weaving shed.

The universal method of treating china clay for heavily-sized goods is to boil it with water, and the chloride of magnesium used in the mixing, for periods varying from two to six hours. It is rarely that anyone considers the amount of steam used in this operation, and the amount of time wasted in this way. Before the clay can be used it has to be cooled to a temperature sufficiently low to allow of its admixture with the starchy matters of the size, so that it may not burst the granules of starch.

So accustomed are sizers to this method of treating china clay that it seems to be taken for granted that this is the only possible method of treating it. It is never con-

sidered that the only point gained is the separation of the particles of clay from one another. In boiling starchy matter there is a totally different action. The heat breaks up the granules of the starch, and renders the particles so small that they lose all characteristic shape, even when viewed under the most powerful miscroscope. With china clay, however, there are no granules to break up.

It will be found that if a piece of china clay be dried it is much easier to reduce to a fine powder than is the case with a piece of china clay taken straight from the bag. This experiment led me to think that china clay should be broken up before it is mixed, I therefore carried out some experiments on a larger scale, and had a quantity of clay put through a disintegrator, with the result that the substance was reduced to a powder as finely separated as the ordinary powdered French chalk. In this state it simply required to be mixed with the other ingredients, and the whole heated until the tallow melted and became incorporated. The boiling operation was entirely unnecessary, and no time was lost waiting for the clay mixture to cool down before completing the mixing. The mixings made with this treatment were finer, and gave better results in the weaving shed when compared with similar classes of mixings made in the usual way.

The only difficulty in the matter is the question of the necessary plant for powdering the china clay; but I am firmly convinced that it is the correct method, and if some firm of china clay merchants would take the matter up, they would be amply recompensed for the extra labor by the increase of the sale of their powdered clay, as soon as the advantages of it were realized.

In some districts Epsom salts are largely used for weighting purposes. This substance seems to be confined to ball sizers, as it retains the characteristics of ball-sized yarns; but it is not often used in ordinary tape-sizing in any great weight.

DELIQUESCENTS.

There are a number of deliquescent substances which may be employed in sizing for the purpose of assisting the yarn to absorb moisture in the weaving shed. The principal substances are chloride of magnesium, chloride of calcium, and glycerine.

Chloride of magnesium has been found the best for general use, and it has the advantage of being cheap, and as a rule free from all objectionable impurities.

Chloride of calcium is employed occasionally, but it is not generally suitable as the magnesium salt. It is more liable to contain objectionable impurities, such as iron and free acids. This is because a large quantity of the chloride of calcium sold to sizers is a by-product, and was formerly a trade waste. Chloride of calcium will not mix with Epsom salts, on account of the chemical reaction which goes on.

Glycerine has come into use of late years, but it is too dear for heavy sizing. It may be used to advantage in very light sizing where the use of chloride of magnesium and chloride of calcium is prohibited.

The effect of deliquescents is twofold. In the first place they enable the yarn to absorb moisture, thus strengthening it, and at the same time making it more pliable. In the second place they assist in fixing the china clay to the yarn, and preventing it from being rubbed off during the operation of weaving.

Care must be exercised that too much of these deliquescent substances is not used, otherwise numerous troubles may arise. Iron stains are frequently caused by an excess being used. The deliquescent in excess will absorb moisture sufficient to rust those portions of the loom with which the yarn comes in contact, especially the reeds. A great deal of damage has been caused in this way, and very often through the manufacturer trying to reduce the cost of "mixing" by substituting chloride of magnesium for a portion of the tallow. An excess of chloride of magnesium will always render the cloth liable to mildew.

ANTISEPTICS.

Chloride of zinc is the antiseptic substance almost invariably used for preserving cloth from mildew. It should be used in the proportion of 3 1/2 to 4 gallons at 102° Tw. to 280 lbs. of starchy matter. This quantity will be ample, providing that the yarns are not tapered excessively damp, or the cloth is not allowed to get wet, or there is not an excess

of chloride of magnesium. Care must be taken that the chloride of zinc is commercially pure; it is not an uncommon practice for dealers to adulterate this substance with common salt and chloride of magnesium, in order to enhance their profits.

Salicylic acid is also coming to the front as an antiseptic for pure-sized goods that have to shipped in the grey; 4 to 6 ozs. is sufficient for 100 lbs. of starchy matter.

In addition to the ingredients mentioned, there are many others used in sizing. Most of them are patent softeners, glycerine substitutes, tallow substitutes, patent emulsifiers, gummy-looking substances, secret chemical mixings, etc., etc.—each and every one of which is guaranteed to produce a better size, reduce the amount of tallow required, save the healds and reeds, increase the average, prevent the clay dusting-off, and finally make a cloth which will command a higher price than can be obtained by the use of the ordinary ingredients. There is one thing, however, that the dealers in these wonderful preparations never mention: and that is, that these fancy nostrums are produced more with the object of making large profits for the seller, than with the object of materially benefiting the user. The majority of these preparations are made from the same ingredients in general use in the mill, and the chief addition to them is water, incorporated by boiling the substances.

MOISTURE.

The subject of excessive moisture in cotton is exercising the minds of many people at the present time, and the members of this Association are to be complimented upon the prominent manner in which they have identified themselves with this desirable agitation for a fixed standard. Yet the amount of excess moisture in cotton is a mere "fleabite" compared with the amount of excess moisture in many substances sold as ingredients for size. As a matter of fact, many of the patent (?) softeners contain from 40 per cent. to 97 per cent. of water. This excess of water is, in every case, without a single exception, driven off when the yarns are dried on the cylinders of the tape frame; and the lost portion of the ingredient is never again recovered, so far as the cloth is concerned. When £10 to £20 per ton has been paid for this water, I think that you will agree with me that this is not an economical way of buying sizing ingredients.

BEST RESULTS.

The aim of every manager should be to obtain the best results in sizing at a minimum of cost. This can be accomplished by using the following ingredients: Flour, farina, sago, maize, rice, and dextrine, for adhesive purposes. Tallow and paraffin wax for softeners. Chloride of magnesium for the deliquescent. China clay or Epsom salts for weighting. Chloride of zinc or salicylic acid for preventing mildew. With these ingredients in a pure state, and with the addition of a little caustic soda for the purpose of neutralizing the acids where the flour has been fermented, and to prevent bacterial action with farina, it is possible to obtain better results, with less liability of getting into trouble, than can be obtained by using any one, or any combination of fancy ingredients offered to sizers.

Select the starch or starches most suitable for the work required, and treat them in the manner I have briefly described. Make all mixings as simple as possible. See that the ingredients are well and uniformly mixed before using them in the tape sizing machine. If possible, allow heavy size to be agitated a few days before using it. Don't be afraid of giving strong, starchy mixings or heavy size mixings plenty of boil. Bear in mind that it does not pay to be too niggardly in the use of tallow. Don't rely too much on Twaddelling for ascertaining the strength of size, but have a proper system for accurately measuring or weighing every ingredient used. See that the yarn is neither over-dried nor overstretched in the tape frame. Test all experiments by careful observation as to how the yarn weaves. There is no machine yet devised for testing sized yarns as to their weaving properties which will give the same results as the actual process of weaving.

In conclusion, let me impress upon you that poor yarn well sized will never weave so well as good yarn well sized; and that the best substance yet discovered for producing good weaving and good cloth is good strong, evenly-spun cotton.

THE PROCESSES OF SILK FINISHING.

BY JAMES CHITTICK.

In the finishing of nearly all skein dyed, silk piece goods, it is to be noted that the treatment given them differs from that employed for most other textiles, in that the former are finished dry and go through no wet processes. Imperfections that occur in the previous processes will, therefore, not be covered up by the finishing, nor will the goods appreciably lose in length or width in the operation.

The usual results that the treatment designs to secure, according to the fashion of the day and the requirements of the trade, are the stiffening or softening, making more full to the hand or making thinner, lustring, smoothing and stretching, singeing, moireing or watering, embossing, etc., etc., and of course the final folding, papering, and putting in shape for the market.

Various machines in common use in broad-silk finishing plants are the spray machines, paper drying machines, button breakers (upright and horizontal), knife breakers, cylindering machines of various sorts, and which are often made with expanding rollers for smoothing out wrinkles and stretching the cloth to its full width, calenders, hydraulic presses, singeing machines, polishing machines, brushing machines, tentering frames, sewing machines, folding and measuring machines, and sometimes embossing machines.

The function of the spray machine is, as its name implies, to spray the goods with a sizing mixture. This is effected by passing the goods lengthways through the machine, at full stretch, they being unrolled from a roller at one end and wound up on another at the other end, say fifteen feet, or any workable distance apart. While passing between these two rollers, spray nozzles are opened from each side which discharge, horizontally and above the cloth, a sizing in a finely atomized condition. It is customary to have about four nozzles on each side, the two sets, however, not being opposite each other. These nozzles are supplied from metal boxes or troughs in which their lower ends are immersed, and either live steam or compressed air can be used as the actuating force. The latter is preferred by many, for if there is any entrained water in the steam pipes it is likely to cause the size to fall on the goods in the form of drops, instead of like dew, and thus cause damage.

The sizing is composed of various materials, gums, glues, gelatines, waxes, starches, or what not, each finisher having his own preparation and generally imagining that there is no other mixture equal to it. This should be well cooked in a porcelain lined, jacketed, steam kettle, and should be made fresh every day and used hot.

The number of nozzles to be opened depends on the judgment of the finisher, as some goods require much filling up or stiffening and others but little. Where goods require excessive gumming, such as grenadines, or very cheap and thin goods, they may be finished "au mouiller," as it is called. This consists in passing the goods between rollers revolving in a trough of size, which thoroughly saturates them, any surplus size being squeezed out. Whether finished with the spray or "au mouiller" it would not do to roll the goods up in their damp condition, so at another part of the machine is a steam heated cylinder (eighteen inches diameter is a convenient size), and also a roll of finishing paper. This finishing paper should be a thick, strong, tough, and good manila paper —not easily torn, for it is used over and over again and should last a long time. The paper passes round the heated cylinder and gets very hot, and this paper, and the goods that have just been gummed, are delivered together to the take-up roller and rolled up. The consequence is that the hot paper dries up the goods and the goods dampen the paper somewhat.

It is customary to sew several pieces of goods together before starting them through the finishing, the number depending on the length and thickness of the pieces, as, when rolled up with the paper, it would not do to have the rolls too heavy and cumbersome to handle. The sewing is conveniently done on one of those machines where the end edges of the pieces are held out by pins and the machine, turned by hand, travels along the seam as it sews. Three hundred to five hundred yards could be handled in one length conveniently. For ordinary dress silks, four

hundred yards is a very usual length and the rolls of finishing paper are provided in similar suitable lengths.

The rollers can be made of white wood, five or six inches in diameter with a square hole through the middle from end to end, one inch or one and a quarter inches square. They are mounted on square iron bars, turned round to fit the bearings where they rest in the machine. One inch square bars are lighter to handle and quite strong enough, but whatever size is adopted it should be the same for all machines so that the rollers will be interchangeable. Stout canvas laps are attached to them by being wedged with strips of wood into slots cut the length of the roller, and to these the ends of the goods are sewn, or may be fastened with wire skewers.

It is proper to have the place where the spraying is done partitioned off from the rest of the plant so that the gummy vapor, which is very troublesome, will not spread through the room and settle on everything. Special steps, too, have to be taken to keep the spray room free from this vapor that it may not condense and drip over everything; this is usually effected by means of ventilating fans, or steam jets blowing up through vertical sheet metal pipes so as to create a suction. In order to guard against the serious damage by spotting that would ensue if the vapor collected on the ceiling and dripped down upon the goods there are various contrivances employed. One that works very well is to have a horizontal coil of one-half inch steam pipe hung from the ceiling over the machine, with steam connection. It should be sufficiently long to overlap the extreme length of the goods, and about five feet in width should be sufficient. A good height for the coil to hang above the goods is five or six feet, but this is a matter of convenience. Underneath the coil, and fastened tightly to it by wires, are sheets of galvanized iron. This therefore provides, when the steam is on, a very hot metal ceiling over the exposed silk, and the vapor coming in contact with it dries at once and does not drip. After the spraying for the day is over the dried gum can be readily scraped off the smooth surface of the plates.

A good flooring for the room is concrete, made of ashes and cement, and topped with asphalt, and it should have ample sized drain pipes, as small ones will clog up with gum. If the finishing is done on an upper floor, care in making the floor, flashings and pipe connections must be taken to prevent leakage to the floor below, and also to prevent the rotting of the wooden floor and beams under the concrete. The ceiling, walls and floor should be well washed down each day with hot water from a hose, and the machine thoroughly cleaned and freed from gum. If no hot water is available a Y-shaped connection of a steam and water pipe will furnish it.

The atomizers must be kept in good order, as they and their pipe connections are very subject to leakage. Hard bronze is a suitable metal for them, and with steel nozzle tips by preference. A pressure gauge should be provided so that the force of the blast will be indicated and can be kept regular, and where live steam is used for the pressure it is proper to have a reducing valve on the line leading from the boiler so as to cut down the pressure on the piping of the machine.

When a roll of goods has been gummed as described, it is put in a machine or frame, in which the goods and paper are separated, and each rolled up on separate rollers. The paper, as has been stated, will then be somewhat damp, and this is now taken to a paper drying machine where it is thoroughly dried by being passed over a steam heated cylinder and so is ready for use again. This can be done, if desired, on the heated cylinder of the spray machine when spraying is not being done. A good stock of rolls of paper, dry and ready for use, is of course kept constantly on hand.

The roll of silk—now dry and warm—will be found to be papery to a greater or less degree, according to the amount of gumming that has been given to it. In order to soften the goods and give them a proper touch, while not robbing them of the sizing that has been fed to them, the button breaker is employed. This is an upright, or horizontal, frame in which is set close together a series of wooden rollers, about three or four inches in diameter, and into the faces of these rollers are driven round head brass tacks spaced an inch or two between centres, and set in rows, staggered. Nails with heads from about three-eighth inch to three-quar-

ter inch diameter are used—but all the nails in one machine will be the same size. The number of rollers will vary from twelve to twenty-five, and they may be arranged in single or double rows. There are also arrangements for varying their position and the consequent tension on the goods. The pieces are passed in and out among these rollers, the number used and the tension applied being governed by the judgment of the operator according to the results desired.

(To be continued.)

A CONDENSER FOR WOOLEN CARDS.

A device for condensing carded woolen slivers, the invention of Eugene Berger, Evelon, France, has recently been patented in the United States. The inventor states that Fig. 1 is a sectional view of the condenser and parts of the card adjacent; Fig. 2, a front view of the condenser only; 1, 2, 3 and 4 indicate the rollers of the card. The wool slivers after passing through these rollers are submitted to the action of a rotary comb and pass out between the drawing-roll and the presser-roll. These slivers are then guided in channels of a number corresponding to the number of slivers and after passing through these reach the condensing device. This consists, essentially, of two disks, a b, on a shaft, c, the faces of the disks being approximately parallel to each other and longitudinally displaceable along the shaft, c. Fixed to the shaft, c, are collars, g f; springs, a' b', are interposed between these collars and the disks, forcing the latter toward each other. Sleeves are provided which extend from the collars toward the disks, completely covering the springs. A second independent shaft, e, is parallel to the shaft, c, and mounted rigidly upon this shaft is a disk, d, similar to the disks, a b, the shaft, e, being arranged at such a distance from the shaft, c, that the disk, d, is between the disks, a and b, in the manner shown. The wool slivers pass between either face of the disk, d, and the adjacent faces of the disks, a and b. To impart a twisting action to the slivers, the shafts, c e, rotate in opposite directions, so that while a pressure is exerted in one direction upon one side of the sliver a pressure in the opposite direction is exerted in the opposite side so that the sliver is condensed to the desired degree, depending upon the adjustment of the springs.

Owing to the rotary motion of the disks in opposite directions, a feeding motion is imparted to the slivers, so that the slivers can be passed to the bobbins upon which they are to be wound. In order to permit of the introduction of the slivers between the disks, a and d and d and b, the disks, a and b, are controlled by forks, f g, by means of which they may be shifted along the shaft, c, and separated as desired.

A condenser is thus provided which, it is stated, not only exerts an effective twisting or condensing action upon the slivers, but at the same time effects the feeding of the same so that they may be readily wound upon the bobbins. The device is adjusted so as to be used upon wool slivers of different quality and of different size. The improved condenser also has the advantage of simplicity of construction and the inventor states that in practice it has been found to be more durable and economical than the rotary rubbers or buffs which have heretofore been used for effecting the condensing operation.

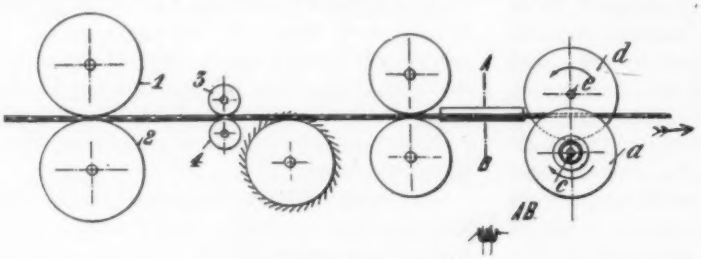


FIG. 1.

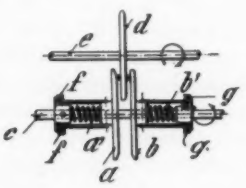


FIG. 2.

There are over 21,000 textile establishments in Austria.

A NEW KNOT TYER.

A device for tying cord used for wrapping parcels, shown in the drawings herewith, has recently been patented in this country and is interesting in view of its possible use in the mill. Fig. 1 is a side elevation of the knotter; Fig. 2, a view of the working part showing the knot in process of tying.

The base is adapted to be secured on a table or counter, and is provided at its outer end with an upwardly-extending standard portion, from the upper end of which projects a former, terminating in a truncated cone. This former is provided at a suitable distance from the lower side with a bore, which operates a similarly-shaped rod and

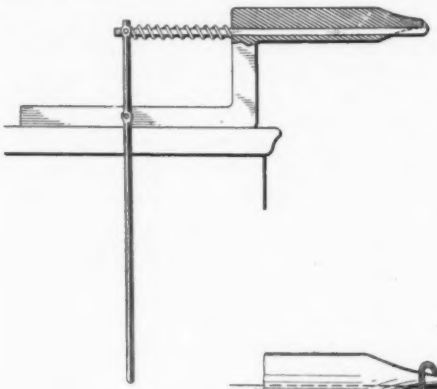


FIG. 1.

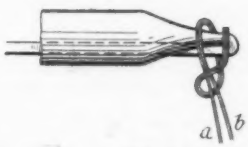


FIG. 2.

hook. The inner end of the rod projects beyond the inner end of the former and is connected to the upper end of a lever, which may be readily operated by the foot or knee of the operator. A spring is employed to move the rod inwardly. This spring is shown as an extensile spring placed on the rod and bearing between the inner end of the former and the upper end of the lever. The function of the spring is to engage the hook with the outer end of the former-cone.

In the operation of this device the two strings, a b, are caught near one end between the finger and thumb of the left hand. With the right hand the operator passes the string below the coned or tapered end of the former, around it, back and upwardly over it, and then to the front. The operator then presses the lever by his foot or knee to cause the hooked end of the rod to protrude from the end of the conical or tapered former, and the ends of the string in the left hand are moved over the strings and placed so that the hook, by means of the spring, is caused to hold the ends of the string between the hook and the reduced end of the former. The strings are then passed by the right hand around to a position at right angles to the axis of the former to form a loop which slips over the end of the former and also over the hook, thereby forming a knot. The spring-pressed hook acts with the outer end of the former to hold the ends of the string until the knot has been tightened, after which the ends of the string are released from the hook.

THE CORD KNOTTER ON THE SELF BINDING HARVESTER.

The accompanying drawings were omitted from the article published under the above

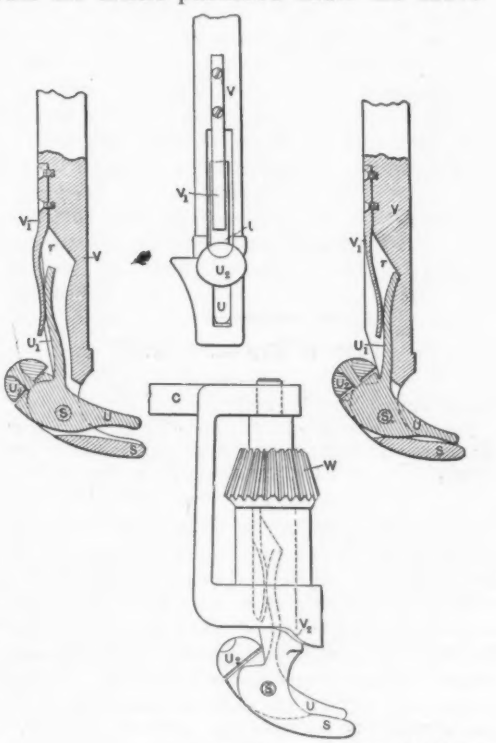


FIG. 8. (*From Machinery.*)

heading on page 124 of our September issue and are reproduced here to make the article complete.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Horizontal and Vertical Rings.

Editor Textile World Record:

In the August issue of your journal there are several replies to a question asked by Brooks on the relative merits of vertical and horizontal rings for twisting worsted and cotton yarn. Cumberland says that vertical rings are never used for worsted yarn. Now this is entirely wrong as every man who is at all conversant with this branch of the worsted business knows that any number of the best-equipped and most up to date mills in England are using vertical rings for dry worsted twisting.

Quinn says that a vertical ring would require a horizontal spindle. I would advise him to look into the matter for he is far from the truth.

I agree with Saco as far as he goes, but I would go a step further and say that the wear and tear on the horizontal ring is greater in either wet or dry twisting than on the vertical.

I think J. T. B. intended to say that horizontal (not vertical) rings are preferred for dry twisting owing to the cost of wear and tear, etc.

Vexatus.

Price of Top per "Pack"

Editor Textile World Record:

I notice the price of worsted top quoted at Bradford as so many pounds and shillings per "pack." What is the meaning of this expression?

Packer (715).

A Bradford pack of top is 240 pounds. There are 240 pence in a pound sterling. Consequently the price of top in pence per pound corresponds with the price per pack in pounds sterling. If a pack costs £19, a pound costs 19 pence. Our English correspondent to whom this question was referred writes us as follows: "Bradford tops are bought and sold by the pack of 240 pounds, and you will readily see how easy it is to reckon the cost in money of 1,000 packs, and the profit or loss on a deal, without a decimal currency."

Weight per Square Yard.

Editor Textile World Record:

Please publish in your Question and Answer Department a solution of the following textile problem:

Ex. A cotton fabric has 74 ends of 20s warp and 66 picks of 20s filling per inch. Find weight per square yard, allowing for take-up 13 per cent. in warp and 12 per cent. in filling.

I would also like to have an explanation of the method of allowing for take-up of warp and filling.

Otto Wood (737)

The allowance for take-up in warp and filling is made by percentage on the spun length of the yarn taken as a basis. This spun length is the length on the warp beam for warp, and that on the bobbin for filling. If the warp take-up is 13 per cent. then 100 yards of warp will make (100—13) 87 yards of cloth. If the filling take-up is 12 per cent. then 100 yards of filling yarn on the bobbin will measure (100—12) 88 yards in the cloth.

The yarn length is the basis of 100 per cent.

The take-up is expressed by the rate per cent.

The cloth length is the yield per cent.

The calculations of allowance for take-up are thus simple operations in percentage. The spun length is found as follows:

Ex. What length of warp is required for a 50-yard cut with a warp take-up of 13 per cent?

50 ÷ .87 (yield) = 57½ yards of warp.

The weight of the fabric in the problem given by Otto Wood is calculated as follows:

20s cotton = (20×5½) 10½ runs.
74 (E) × 36 (in.) = 2664
2664 ÷ .87 (yield) = 3062 yds. of warp.
66 (picks) × 36 (in.) = 2376
2376 ÷ .88 (yield) = 2700 yds. of filling.
3062 (yds.) ÷ 1050 (yds. per oz.) = 2.9 ozs. warp.
2700 (yds.) ÷ 1050 (yds. per oz.) = 2.6 " filling.

Weight per square yard 5.5 ounces.

The mistake is sometimes made of taking the cloth length as the basis of 100 per cent. By this method a take-up of 13 per cent. means that 100 yards of cloth requires 113 yards of warp.

The first method by which the spun length is taken as a basis is to be preferred, because it corresponds to the usual method of making allowances for losses in other processes, by which the original length or weight is considered the basis. Thus an allowance of 15 per cent. for waste in carding and spinning means that 100 pounds of cotton at the picker yields 85 pounds of spun yarn. Likewise a take-up of 15 per cent. in weaving means that 100 yards of warp yields 85 yards of cloth.

Sisal Hemp.

Editor Textile World Record:

We are thinking of organizing a company to produce sisal hemp in Porto Rico and would like answers to the following questions with any further information you can give us on the subject: Has the sisal grass business ever been carried on in Porto Rico? Have samples of Porto Rican sisal ever been tested? How does it compare with Mexican and Yucatan sisal? How long must the Maguay plant grow before ripe leaves can be cut? What is the average number of leaves a plant will yield? Octagon (739).

These questions have been answered by Charles Richards Dodge as follows:

The cultivation of sisal hemp as a commercial industry has not been carried on in Porto Rico, although there has been some experimentation, and limited areas of test plants have recently been put out. I believe the agricultural experiment station of the island has been interested in the work.

The plants which have been introduced into the island are not the true Yucatan sisal hemp plant, but the variety of Agave rigida which grows in a semi-wild state in southern Florida,—particularly along the keys, and which is cultivated to some extent in the Bahamas and in Hawaii. While the Porto Rican plants were not imported direct from Florida, they are no doubt the progeny of plants originally carried from Florida to the Bahamas and elsewhere, the Florida plants having been introduced from Campeachy by Dr. Perrine, seventy years ago.

The variety, agave (rigida) sisalana, which is produced in Florida, the Bahamas and Hawaii, yields a fibre of superior strength and whiteness, and of good length when mature leaves are employed. Whether the fibre from these round-about introductions would be the same or not could only be determined by experiment. Because a plant produces a certain quality of fibre in one locality, it cannot be taken for granted that its yield will be exactly the same under other conditions.

A very important point to consider in establishing a new sisal hemp industry, outside of Yucatan, is the question of the longevity of the plants. The different species of agave as a rule blossom at the age of seven or eight years, the act of blossoming ending the life of the plant. With the peculiar conditions which exist in Yucatan, such as the hot, dry climate, the aridity of the soil, which is often a mere bed of semi-decomposed coral rock, lying almost at sea level, the blossoming of the plants is so retarded that after a field of plants has come to the cutting age—say about five years—annual crops of leaves may be taken off for fifteen or twenty years, and I have seen plants thirty-two years old that had not yet flowered.

In no locality outside of Yucatan, of which I have knowledge, is the blossoming retarded in this manner. After seven or eight years from the time they are set out, they will send up their tall flower masts, and there is no way to prevent it. As the juices of the leaves go into the rapidly growing flower stalk, the plant withers and dies. This of course limits the usefulness of the plants to a period of a very few years,—say three to five—though three comes nearer the mark—and it adds materially to the expense of maintaining plantations. This is true in southern Florida, in the Bahamas, in Hawaii (as they are just learning) and in portions of Mexico proper, where I have made investigations. As it is a dollars-and-cents proposition it should be understood at the outset. The variety sisalana, which has been introduced into Porto Rico, is the spineless form of sisal hemp plant, and it gives a smaller percentage of fibre to the ton of leaves than the Yucatan variety—probably because the leaves are more pulpy and succulent.

In my Yucatan investigations I found that as a rule the more thrifty a field of plants appeared to be, the lower was the fibre yield, and my experiments showed a range of 65 pounds to 135 pounds of dry fibre to the short ton of leaves, hand cleaned. In my Florida experiments with a Van Buren machine the best yield was 3.5 per cent., and the best recorded yield of Bahaman fibre is about 3.7 per cent. The Yucatan form of the sisal hemp plant is known as Agave (rigida) elongata, the spined variety, or true henequen.

I am informed by Mr. O. W. Barrett, late botanist of the Porto Rican Station, that the "maguay" growing wild on the island is Furcraea foetida, a plant which abounds in tropical America from Central America to Brazil, and which is found in other parts of the world, is said to be the species which yields the well known Mauritius hemp of commerce, cultivated in Mauritius and St. Helena. The plants are of moderately quick growth, and produce long, fleshy leaves, sometimes measuring seven and eight feet, though they yield a less percentage of fibre than the sisal hemp plant.

Dr. W. H. Evans, of the Bureau of Experiment Stations, who has recently visited Porto Rico, informs me that the wild plants of this species are found growing only in scattered clumps, and in insufficient numbers to support even a very small commercial industry. This being the case, to put such an industry on a paying basis, regular plantations would need to be established, and cultivated in the same manner as the sisal hemp industry is conducted. Wild growth will not support a commercial industry in any country that I have visited and investigated.

I must protest, however, against the use of the name "maguay" for this species. The group of Agaves known as the maguays are distinctively different, and the fibre is wholly unlike. In Central America the plant is known as the Cabuja, in Venezuela as the Cocuiza, and in Mauritius as aloes vert, or the foetid aloe. The fibre is known in Venezuela as fique. It is softer than sisal, of good strength, but it cannot rank with sisal as a commercial cordage fibre. One advantage of the plant is that it will grow at almost any elevation, and is not a sea-level proposition. The lower yield of the fibre is a matter for consideration, the best reported yield of Mauritius being about 3 per cent. I do not believe the Porto Rican plants will average 3 per cent. and the quality of the fibre should be tested.

Regarding the age at which the Cabuja blossoms, I cannot make positive statements, but I am of the opinion that it is retarded considerably beyond the age at which the Agaves blossom. As to the number of leaves upon a mature plant, having never counted them, I should state, as an estimate, 40 to 60. It should be borne in mind, however, that, as in sisal hemp culture, only the lower, mature leaves are taken for fibre. In Yucatan 12 to 15 leaves are taken annually, but all these are not cut at the same time, for it would not be possible for a plant to bear 12 to 15 leaves of equal maturity at one time, because they open out, one by one, from the cogolla or central spike of unopened leaves,—the method of growth of all this tribe of plants.

There is another tropical American species, allied to the above, known as Furcraea cubensis. It is a smaller plant, and yields even a lower percentage of fibre.

Calculating the Weight of Filling.

Editor Textile World Record:

If a fabric is woven with three kinds of filling of different counts, how is the weight of each per yard or cut calculated?

Rock Island (707).

The number of yards of each size of yarn is first found. Then the weight is calculated from the length and yarn count. The operation is best explained by an example:

Ex. A cloth is woven 65 inches wide with 24 picks per inch. The filling pattern consists of 48 picks divided as follows: 6 picks 1/20s cotton, 8 picks 3 run woolen, 10 picks 2/36s worsted. Find weight of each kind of yarn per yard.

65 (inches) × 48 (picks) = 3,120 yards filling. Allow 5 per cent. for take-up as the filling is usually woven slacker than when reeled:

3,120 (yards) ÷ .95 (100% — 5%) = 3,284 yards of yarn per yard. The 3,284 yards is then divided in the proportion in which the three kinds of yarns are found in the filling pattern, as follows:

6 picks 1/20s cotton	= 821 yards.
8 picks 3 run woolen	= 1,095 yards.
10 picks 2/36s worsted	= 1,368 yards.
	3,284 yards.

Next step reduce the cotton and worsted counts to runs and calculate weight of each kind of yarn:

1/20s cotton = 10.5 Runs.
2/36s worsted = 6.3 Runs.

821 (yards) ÷ 1050 (yds. per oz.)	=	.78 ounces.
1095 (yards) ÷ 300 (yds. per oz.)	=	3.65 ounces.
1368 (yards) ÷ 630 (yds. per oz.)	=	2.17 ounces.
		6.60 ounces.

The reduction of cotton and worsted counts to runs or yards per ounce is made as follows:

Cotton No. × .5 1/4 = Runs.
Worsted No. × .3 1/2 = Runs.

Number of Yards in a Cut.

Editor Textile World Record:

Can the number of yards in a cut be figured from the beam on the loom, when the diameter of the barrel and length of beam and size of the yarn are known Will the amount of size in the yarn have to be considered and the number of picks?

Williston (746)

We do not see how it would be possible to determine the length of a cut from the size of the yarn on the beam. The number of cuts depends not only on the length of the warp, but on the length of the cut, and a short warp may contain as many cuts as a long one providing the length of the cuts is made to correspond.

If Williston intends to ask whether the length of the warp can be determined from the size of the empty and full beams then the question becomes more susceptible of a reply. If the yarn is wound on the beam at a uniform density the volume or cubic capacity of the yarn would bear a constant relation to the length of the warp. The tension varies, however, and consequently the density of the yarn on the beam varies with it; for this reason it would be necessary to have data as to the number of yards of warp in a cubic inch or foot of beamed yarn on which to base the calculations of the length from the size of the beam. By this method of estimating, the amount of size need not be taken into consideration. The number of picks in the cloth has nothing to do with the length of the warp on a beam.

Metallic Shuttles.

Editor Textile World Record:

Are there no good metallic loom shuttles on the market? How are they inferior to wooden shuttles? I should think a metallic shuttle made of the right material would have many advantages over a wooden one. Alloy (722).

I do not know of any metal shuttles being used at present. They have been tried many times, but they have not been a success for several reasons. Heat is generated, particularly in the shuttle box and this has a tendency to tender the yarn. Electricity is generated in a wooden shuttle, and this would be increased in a metal one. Often shuttles fall and are damaged and for this reason it would be a difficult matter to keep a metallic shuttle in good condition. Again a dent in a metal shuttle would have more effect on the yarn than a wooden shuttle would have. There is a certain amount of friction between the race plate and the shuttle; if a metal shuttle is used this objectionable feature would be greater. A race board always shows two marks across the board from box to box. These marks correspond with the bottom of the shuttle and yet the shuttle and the board are separated by the yarn.

Aluminum is about the only metal that can approach the weight of wood for shuttles, and would be too expensive. The binders would cause the metal shuttle to wear and minute particles of metal would be scattered in the cloth.

Will Nelson.

Elastic Fabric without Rubber.

Editor Textile World Record:

Enclosed is sample of a fabric that is elastic, but contains no rubber. Is anything like it manufactured in this country and if so, where?

Henry Vilas (709).

The sample received with this enquiry is a cotton fabric that is very elastic filling ways. This elasticity is due entirely to the filling yarn being a 2-ply yarn twisted very hard. As soon as the cloth is woven with this hard twisted filling it contracts by reason of the hard twist. Upon measuring a sample of the cloth, raveling a thread of the filling from it and then measuring the filling when stretched to its full length we find that the cloth crossways is 45 per cent. of the length of the filling yarn when stretched. The filling raveled from the sample 1.8 inches wide measures 4 inches long when stretched out. The warp is a soft-twisted single yarn. An analysis of this fabric gives the following results:

Weight, 2 1/6 yards per pound.
Warp, 39 threads single 11s per inch.
Filling, 43 threads 2/12s per inch.
Weave, plain.

The sizes given here are as the yarn lies in the finished cloth. As the filling in the cloth is but 45 per cent. of the length when stretched out, the count of the yarn when stretched is found as follows:

6 (count in cloth) ÷ .45 (per cent. of yield) = 13 1/3, or 2/27s, stretched count of filling.

This cloth can be made on any ordinary loom, as there is nothing special in the method of weaving. Care must be taken to lay the warp wide enough in the reed to allow for the contraction after it leaves the loom.

Spots on Cotton Piece Goods.

Editor Textile World Record:

We are troubled with dark spots in our piece goods dyed with a basic color on a sumac and antimony mordant. This is the order of processes: Bleached with chlorine, no acid used, bisulphite of soda used as anti-chlorine. No trace of chlorine is left in the goods. They are then run through a water mangle with a small amount of ammonia, dried on dry cans and folded in layers, thence to the dyehouse. They are mordanted and dyed open in a padding machine. They are run through sumac five times, starting boiling hot and running down to cold, using about eight gallons of sumac extract during the five runs, then through a cold solution of antimony salt twice, using four pounds of salt each run. They are then washed in cold water, about a foot of water being put in the padding machine and no more water added. They are then dyed with Methylene Blue and washed in a large amount of boiling water. No spots can be seen in the antimony or sumac but they show up in the first run in the dye. There seems to be no chance for water or oil to drop on the goods; the spots come between layers and any old way. We are doing the bleaching and as usual it is up to us. We have tried everything that we could think of to find the cause, but have had no success. We would like to locate the cause of the trouble and be able to prove it. There are tons and tons of spoiled goods going to waste. Any hints you may be able to give us regarding spots and stains will be very much appreciated. Seneca (747).

This question came to us some time ago and before we had succeeded in finding a solution of the difficulty for our correspondent he wrote us as follows:

"We have found out what caused the stains on the goods of which we sent you samples. They were caused by impure water that contained a large quantity of suspended organic matter."

We publish the question and the inquirer's own reply as it emphasizes the importance of pure water in dyehouses and finishing rooms, a point that is often overlooked by manufacturers.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 236 to 253. Also Buyers' Index.

THE KNIT GOODS SITUATION.

The knit underwear situation is not greatly changed since our last writing. Manufacturers are all very busy on orders that they have had on their books for some time and find so much difficulty in getting their production up to their capacity that they are not looking for duplicate orders on fall lines.

The principal cause of the delay in delivering goods is due to the shortage of help and while raw material conditions are also a source of worriment to manufacturers, the labor problem seems to be the more important. Several of the New York State manufacturers have standing advertisements in a large number of papers and also send representatives to nearby and even remote towns to engage help. All kinds of inducements are being offered, such as, building of homes on small weekly payments, furnishing free lunches, reading rooms, etc. It is estimated that there is a shortage in New York State between 25,000 and 30,000 operators.

Jobbers are all busy, trying to fill their orders given in the months of February, March and April, but report they are having considerable trouble to make complete shipments on account of so many manufacturers being behind on their orders. Stocks are becoming broken and jobbers are obliged to send in orders for special assortments and duplicates; the replies they get from most manufacturers show about the condition of affairs and may be summarized under one general statement to the effect that, "they do not know when they can ship the goods, but will do the best they can." It is believed that deliveries are somewhat better this year than last; nevertheless there are a great many lines that are still away behind and the outlook for anyone who is now looking for fall lines in nearly any class of goods is not bright.

The market is in a position to absorb a large quantity of ladies' 25 cent ribbed vests and pants in case there should be any reduction in prices now ruling, but buyers are not anxious to place any large orders on the basis of $2.25 for 7 pound goods and the "gentlemen's agreement" made last year bids fair to hold until the coming November. In the face of the practically unlimited demand for these goods at prices settled upon at that time, there have been advances of 5 cents per dozen and now the manufacturers making this class of goods claim to be all busy and are accepting orders only for very late delivery.

Men's fleeced goods have been fairly well delivered and it is believed that the majority of jobbers have a good supply on hand to draw from for the next two months, and there will probably be no change in prices on this class of merchandise.

Men's cotton ribbed goods to retail at 50 cents are very scarce. There are practically no manufacturers of this line open for any further business this year, and it is predicted that before another month there will be considerable scurrying around for these goods.

Men's wool goods are being delivered slowly and we find there is some complaint being made regarding the qualities being sent out. It looks as though manufacturers had made their samples a little too good and now find that in order to make a profit, it is necessary to slight the merchandise to some extent.

Jobbers report fairly satisfactory business so far on spring lines. There is no particular change in the demand for ladies' goods unless it be that fewer fancy trimmed garments are being selected and that the tendency is for lighter gauze weights and plain trimming.

In men's goods it is noticed that a greatly increased demand is felt for sleeveless and short sleeve shirts and for knee drawers. This applies to both ribbed and flat goods in white, ecru and colored numbers. In fact, jobbers are complaining at the extent to which this demand is carried, as it practically

means carrying double stocks in almost all lines.

The combination suit business is increasing very rapidly and some retailers state that the present season will show a larger volume of sales on both men's and women's combination suits than on two piece garments. It is believed that the children's combination suit business is not growing in the same proportion as the ladies' and men's. This is explained by the fact that proper attention is not given to the matter of sizes. We believe that there is a large field open for manufacturers who will take up this matter and see that a properly proportioned line of children's combination suits is put on the market. Among the new numbers of combination suits shown this season is a men's white lisle garment made with blue striped collarette neck to retail at $1.00. This is made by the Avalon Knitwear Co. and jobbers who have this number in their line report a large business on it.

There seems to be an almost unlimited sale of nainsook goods for spring. These are taken in coat shape, sleeveless shirts and knee drawers and may be had in qualities to retail at 50 cents and upwards.

Men's sleeveless and buttonless ribbed shirts to retail at 25 cents are meeting with large sales. These goods are made by manufacturers of ladies' ribbed vests and there are no drawers shown to match them.

HOSIERY.

Hosiery buyers are apparently eager for merchandise and whenever a manufacturer signifies his willingness to accept orders for a few cases, he has no difficulty in getting plenty of customers. The domestic hosiery lines are, therefore, in a very well sold up condition; not only the fall lines, but on nearly all lines for spring, 1907.

Buyers are inclined to go a little slow on coarse gauge and heavier weights, possibly under the impression that the recent decline of raw cotton may effect the prices at which these goods are now held, but there is nothing in the attitude of manufacturers to lend any encouragement.

In the hosiery end, as well as in the underwear, labor continues to be the all important problem and manufacturers are making strenuous efforts to increase their finish force, but with little success.

Wool, worsted and cashmere lines are hard to get delivered and it is predicted that October will witness the greatest scarcity of this class of goods that has ever occurred. It looks now as if this class of manufacturers had not asked a proper advance for their goods this season and that now, many of them, having exhausted their supply of yarns carried over, find themselves unable to get yarns and make the goods within 5 to 10 per cent. of what they were sold at.

Fancy colors and patterns of all kinds promise to be good for spring and indeed are called for now, and it is predicted that embroidered, extracted and jacquard fancies will be in greater demand for 1907 than ever before, and indications are that tans will be very good again for men and women.

One of the fads in men's half hose is the new wine shades, described as claret, port, burgundy, etc.

It is stated that split foot hose and half hose in colors are becoming important items in the spring line. Split foot goods of all descriptions are hard to get and consequently the sale of white foot goods has increased, they being taken as a substitute. Mercerized goods in all the popular priced lines are becoming more and more important and the craze for gauzes is greater than ever before. Gauze half hose are also in very active demand.

CHEMNITZ REPORT.

There has been no change in the market during the last two or three weeks, only that it has been filling up still more than it was. Many goods are now shipped from here which have been due many months ago, but which could not be turned out on time. Prices on staple hosiery are high and firm, and there is no prospect that they will fall off during the coming spring season. Yarns are high and as maco yarns are mostly used in this market, they will also stay high, as the production of Egyptian cotton has not grown in proportion with the increased demand for the goods.

Embroidered goods still lead and for early delivery the market is very well supplied with orders. Many makers bluntly refuse orders,

knowing well that even those placed now cannot possibly be filled on time.

Lace hose are still comparatively slow, but the orders are coming in more liberally than a month ago. Buyers have all been holding back on them, expecting that the goods would drop down to the old limit again, but seeing now that this will hardly be the case, they commence to place their orders in order to get some goods when needed.

As to colors, opinions are very much divided. While the high class trade buy a good many fancy shades, the regular trade is very cautious with these, and stick more to the staple colorings which will always be good. While black is still in the lead with white second, dark brown has become rather popular during the last ten days and grey is bought again. A few tans are also bought and a feeling seems to prevail throughout the market that tans will grow in demand as the season advances. Navy is also taken, but not in large quantities. As fancy colors, olive, bordeaux, beaver, mode, hunter's green, heliotrope and purple are the shades mostly in demand.

Trade in gloves is as lively as it has been all season. Makers are way behind with the delivery of fall gloves and by the time the new spring orders are due, the trouble will be worse than ever.

Long gloves are again the craze and the fear that they would lose their popularity, which was felt in the market a short time ago, has all disappeared.

Makers of ribbed underwear have very good orders on hand and with them the season will be an exceptionally large one.

The United States in 1905 took first rank as an export nation, and sold more goods than any other country in the world. The value of the exports from this country was estimated at $1,621,581,000; Great Britain stood second with $1,606,057,000.

According to Government statistics there were in the United States in 1905, 133 establishments for the manufacture of flax, hemp and jute products; the capital invested amounted to $54,405,531; the value of the products, $62,939,329.

WARP KNITTING.

BY FRANZ REH.
(Professor at the Vienna Textile School.)

(Continued from September.)

WARP KNITTED FABRICS.

These present a great variety and to facilitate the study we will group them in several classes according as the surface of the goods is smooth or modified by special effects. Another basis for classification consists in the presence or absence of perforations in the fabric.

PLAIN WARP KNITTED FABRICS.

Under this heading are classed all warp knitted fabrics that present a uniform face. These goods are made with one or several motions. It is easy to determine by observation whether the threads are distributed uniformly, that is, whether each thread of the warp is interlaced in the same manner as the others or not. In the former case all the warp threads drawn through the guides on the same bar are operated in the same way. If, however, one or more threads are distributed differently from the others it indicates the use of a second motion for operating the warp threads. A third group with different interlacements would require a new motion for its production.

WARP KNITTED FABRICS MADE WITH ONE MOTION.

These include the demi simple, the cloth warp, the one-needle sateen and the English leather.

The demi simple fabric has already been described in giving the general account of the distribution of the threads in warp knitting. This fabric is shown at Fig. 31. The interlacements are 1 over, 1 under, and return. This weave is used for either heavy woolen or light cotton fabrics. The motion is called "full thread," in other words, all the guides are threaded. At first sight it appears similar to the ordinary plain knitted fabric, but on closer examination the threads are observed running vertically and the loops obliquely.

Fig. 32 shows the distribution of the threads in what is known as the cloth warp

The distribution is similar to the demi simple, but each thread is carried under two needles before being passed over one. The arrangement becomes therefore 2 under, 1 over and return. All the guides are threaded and the fabric is much thicker because of the distribution under two needles, which absorbs a greater quantity of yarn. The cloth warp fabric is used for carded yarn, usually on wide machines. Ordinarily the goods are fulled, gigged, dyed, tentered, sheared, and pressed after knitting, the processes being similar to those of finishing woven woolen goods. The warp knitted fabric, however, is distinguished by its elasticity, which varies according to the degree with which the goods have been felted. This fabric is used for heavy winter gloves, gaiters, and other articles.

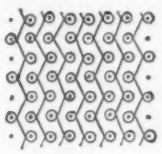


FIG. 31.

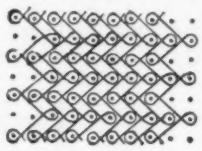


FIG. 32.

FIG. 33.

FIG. 34.

Fig. 33 shows the warp knitted fabric known as English leather (cuir Anglaise). In order to insert as large a number of threads as possible, additional threads called "blind" threads are pressed against the old loops without being previously looped. The process is begun by pressing the guide bar under 2 needles and over 1 to the left, producing a row of loops; then after having distributed these to the right without pressing, they are pushed against the preceding loops, making an additional distribution. This involves three needles: under 3, over 1 to the left and pressing, then under 3, over 1 to the right without pressing. The process is then repeated as shown at Fig. 33, which shows but one thread in order to illustrate the process more clearly. The English leather fabric can be produced by other methods, but always with the characteristic use of additional distributions, which are indicated by a, Fig. 33. They should not be traced above the others, but exactly in the same position as the loops, as they do not constitute a new row of stitches, but are simply pressed against the old row.

While the manufacturer seeks to use a large quantity of material in the cloth warp and English leather fabrics, the opposite is the case when using silk or cotton for summer gloves. Fabrics for this purpose must be as light as possible and consequently there is no distribution under the needles. Several successive rows are produced by distributing over the needle and moving the carrier bar in one direction only. As the warp machine is displaced always to one side there comes a time when it is necessary to move it back. The return row is distributed under 1, over 1, then the distribution over 1 is resumed in the new direction. After several successive rows of loops the order is reversed. Fig. 34 is a partial view of the fabric produced and which is called one-needle sateen. The rows, u, contrasting with the adjacent rows running in a reverse direction cause a horizontal striped effect.

WARP KNITTED FABRICS MADE ON TWO MACHINES.

When a warp knitted fabric is made with two groups of threads interlaced differently it is necessary to use two motions. The most simple of these classes of goods are the simple tricot, double tricot, and sateen. These are derived from the three already described, demi simple, cloth warp, and single needle sateen.

Simple tricot is made with two motions, all the guides being threaded and the distribution being under 1, over 1 and return. But while one of the motions distributes to the right, the other is distributing to the left. The goods are made with silk or fine cotton and used for summer gloves. The structure is shown at Fig. 35 and to make the illustration more clear the two distributions are shown separately at the right of the figure. As the simple tricot is derived from the demi

simple, so the double tricot, Fig. 36, is derived from the cloth warp fabric and results from identical operations, but in a reverse sense, the two motions being opposed to each other.

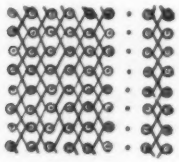


FIG. 35.

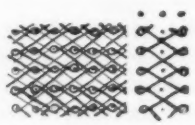


FIG. 36.

At the left of Fig. 36 are shown the two series of threads united, while at the right the distributions are isolated. The sateen

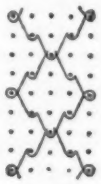


FIG. 37.

tricot is formed by the combination of two one-needle sateens, the two being operated as shown at Fig. 37.

BOUCLE FABRICS.

The cloth tricot and sateen can be made with a boucle effect on one side by using a supplementary carrier bar having each guide threaded, and distributing the threads successively under the needles in forming new loops. These supplementary threads are held by the loops formed by the other bars, particularly those placed under the supplementary bars. The reverse side of the fabric

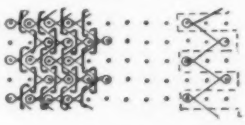


FIG. 38.

is thus covered with loops formed from the supplementary threads, which are not used for forming stitches. By using soft yarn for the extra threads and napping the knitted fabric a very soft furry face can be obtained. Fig. 38 shows the interlacements for the boucle fabric.

WARP KNITTED VELVET AND PLUSH.

Pile fabrics can also be obtained in warp knitting. A supplementary motion independent of those used for the ground is placed above the others and distributes the threads to a comparatively large number of needles, for example, under 4, then over 1. The threads then distributed form long floats on the back of the fabric as shown at Fig. 39. These floating threads do not adhere to the

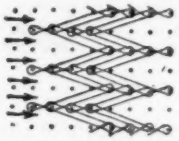


FIG. 39.

ground work and consequently can be cut, forming the pile. After cutting, the loose threads are raised by a brush to increase the velvet or plush effect. There are other methods of obtaining single face pile effects in warp knitting, notably with the Raschel machine. A second row of needles is used in which the needles consist of small pins, round and straight. These in descending leave the loops, which have been placed on them and which, consequently, are not being interlaced with other stitches forming loops on the face of the fabric. These loops are cut with a knife or are broken on a napper, producing the velvet face. With the Raschel machine equipped with two sets of latch needles it is possible to knit two fabrics, stitched together at intervals by the interlacing of the threads. This gives a double velvet fabric, which after cutting results in two single velvet fabrics. The process is similar to woven double velvet. The cutting is done on a special machine having vibrating knives.

(To be continued.)

In 1901 there were employed in all the textile factories of the United Kingdom 1,029,353 persons, of which 379,211 were males and 650,142 were females.

The total quantity of wool imported into the United Kingdom of Great Britain and Ireland in 1905 is estimated at 654 million pounds.

FINISHING HOSIERY.

BY H. W. CROWE.

After many years of experience I have found what I believe to be the best process for finishing fine lisle and mercerized hosiery in blacks, tans, blues, etc. It gives an excellent dull or cloth finish on ladies' and misses' hose and on half hose for men's wear. It also gives good results on mercerized hosiery, giving the goods a soft handle. The hosiery is papered in the ordinary way and put in the steam press, which is running up to the usual pressure. There need be no fear of getting too much gloss from the high pressure, as this is prevented by the subsequent processes. The steam is turned on for half an hour then shut off, and the goods left for another half hour. The steam is then turned on again for fifteen minutes then cooled and left standing for one-half hour longer. The goods are then taken out of the press, reboarded and run through a steam brush. The speed of the brush and the quantity of steam must be regulated to suit the finish desired. This process is used to but a slight extent in this country, but is extensively employed in foreign mills. Some finishers who have tried steaming have found that it takes the life out of the goods. This, however, is generally due to the use of a rush of steam, which gives a poor finish.

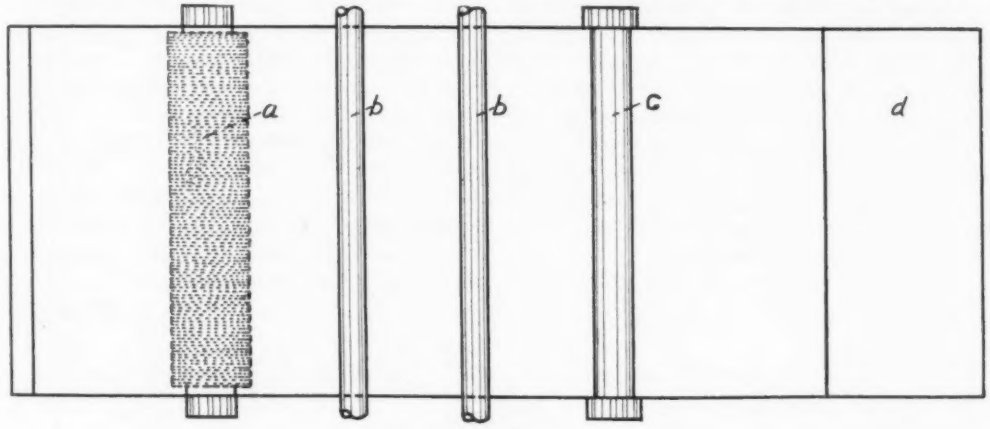


FIG. 1.

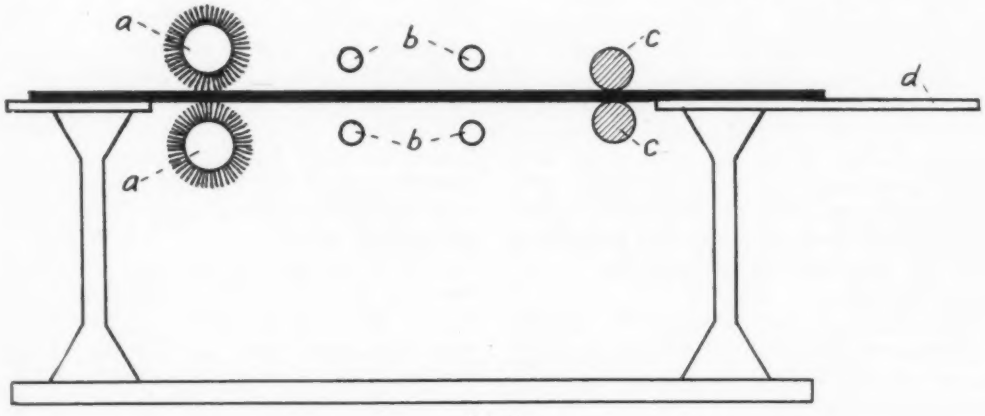


FIG. 2.

The process I have described adds about 1 1/2 or 2 cents a dozen to the cost of manufacture and will be found profitable especially on high-priced goods. Suppose a mill is equipped to make 1,000 dozen a day with

fixed charges of $50 a day, or 5 cents a dozen on full production. If because of unsatisfactory finish the orders and production amount to but 700 dozen a day, the fixed charges are raised to 7 1/10 cents a dozen. The increase is thus greater than the increased cost of steam finish; moreover, the profit of 300 dozen is lost.

Fig. 1 is a sketch of a hosiery steam brush that I built a number of years ago and found to answer all requirements. A sectional view is shown at Fig. 2. It not only takes the gloss from the goods, but brushes them, removing all dirt and loose material, giving the fabric a much better handle and appearance. Care must be taken not to have the brush too stiff. The iron rolls, A, carry the goods through the machine and run opposite to the brush. The perforated steam pipes are at B B, the brushes at C; D is a feed table. The brush and guide rolls can be run by either belts or chain gear, the latter being preferable as slipping and consequent damage to the goods are prevented. The speed of the machine must be adjusted to the requirements of the finish. If the goods are singed after dyeing they can be pressed first and the steam brush adjusted to the singeing machine.

There are very few finishers who understand why they get poor results in pressing ladies' hosiery. Some parts are pressed all right; others not pressed at all. The welt at the top is twice as thick as the leg fabric; from fifteen to twenty layers of goods are papered on one press plate and this brings a greater pressure on the top of the hose. To avoid this and equalize the pressure the ends are sometimes reversed. The result then is that the centre of the goods is not pressed properly.

My method of pressing consists in the use of different sizes of press papers. The regular size is shown at A, Fig. 3. A smaller size is shown at B, while the two sizes with the hose laid between them is shown at C. In this way the pressure is brought uniformly on the leg and foot while the thicker welt is brought beyond the short papers and thus relieved of pressure.

It frequently happens that an imperfect finish on hosiery is caused in the dye house. Being a practical dyer as well as finisher I know from experience that this statement is true. Some dyers use lard or olive oil to soften their goods. Frequently these oils cause trouble. There are also manufacturers who make á mistake in trying to reduce expenses. The finisher and dyer as a general rule are the first to receive orders to get out more goods and cut expenses to help meet competition. The manufacturer, however, fails to take into account the increased number of seconds and the bad work resulting from the undue efforts to crowd the goods through the mill.

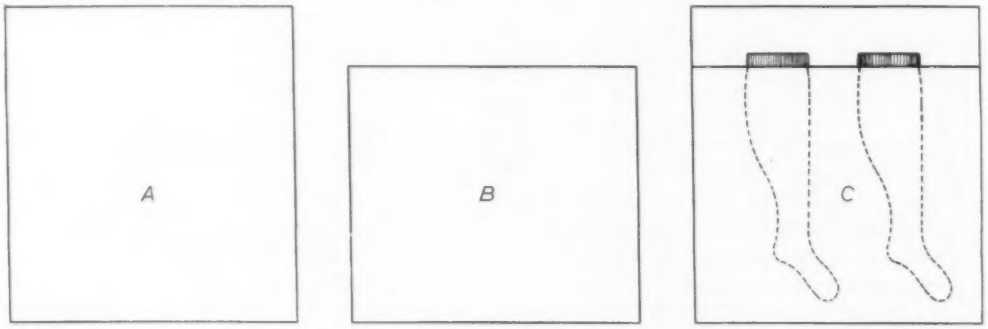


FIG. 3.

I knew a case where two mills were running on the same class of goods. One was using a better grade of yarn than the other and yet it was running only five days a week, while the mill using the poorer grade was running full time and getting as much for the goods as was obtained by the other mill. The manager of the full time mill had the best dye and finish on his goods that could be obtained, while the manager of the short time mill put more money into his yarn, used a cheaper dye and

did not give the finisher time to finish the goods properly. I asked the manager of the short time mill why he used combed yarn when carded yarn costing from four to six cents a pound less would answer, and he replied that his goods did not require so much time in the finishing and dyeing process. He was thus making a few cents a week in the knitting department and losing hundreds of dozens a week on account of the poor dye and finishing. There is nothing that will help more to sell goods than first class dyeing and finishing.

A FASHIONING DEVICE FOR CIRCULAR MACHINES.

A method of raising and lowering the needles of a circular knitting machine at the end of each oscillation when knitting heel or toe piece of a stocking has recently been invented in this country; the device required for it is shown in the accompanying illustrations. Fig. 1 is a perspective view of a portion of the machine; Fig. 2 shows the removable cam carrying portion of the cylinder, a pair of needle-elevating pickers being in position.

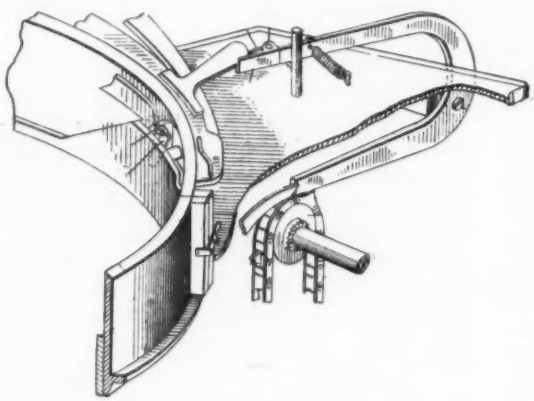


FIG. 1.

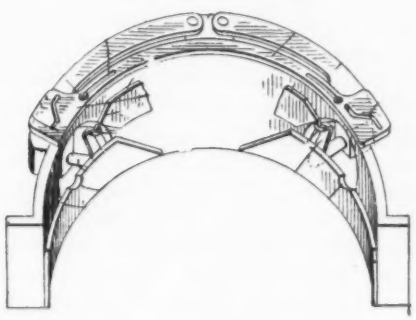


FIG. 2.

As will be seen by reference to Figs. 1 and 2, a lower cam-path is provided and also an upper path. When the needles are engaging the lower path they are in operative position, and when they are elevated so that their heels engage the upper path they are held out of operative position, since they are not carried down by the portions of the cam pulling the yarn downward and forming the loops necessary for the fabric. In knitting the heels and toes it is necessary to lift a portion of the needles out of operative position and then continue to lift a needle out at each end of a vibration employed when working upon the heels or toes. In order to narrow the work automatically pickers are used with the new device. Each picker is made up of a swinging arm carried by the end of the rock-shaft. The outer end of the arm is offset, the offset portion projecting inwardly and having a notched end of suitable shape to engage and lift the heels of the knitting needles. The shaft carrying the picker-arm finds a bearing in the thickened end of a pivoted arm. A spring is also carried by the thickened end of this arm, and bears with its free end upon two flattened surfaces formed upon the shaft so that the arm of the picker is held more or less positively in its raised or lowered position. The outer end of the shaft is provided with a laterally-projecting arm or pin which is engaged by a suitable device mounted upon the machine for rocking the arm. The shaft is so mounted in the end of the arm as to occupy a substantially radial position with respect to the cam-cylinder of the machine. The arm is pivoted to a projecting portion of the knitting machine and is made sufficiently long to permit of its swinging movement being sufficient to carry the picker into and out of operative position without materially altering the radial position of the shaft. The cam-cylinder is formed with an aperture, opposite to the picker, so that the end of the

picker-arm can extend inwardly a sufficient distance to register with the cam-paths. The aperture is made large enough to accommodate the adjustment of the picker, permitting it to be swung to its lowered position or lifted to its raised position. The lower cam-path is notched or recessed to receive the inner end of the picker, the picker when lying in the recess having its needle-engaging surface flush with the upper surface of the lower cam-path. The engagement of the picker with the heel of the needle causes the needle to move the picker-arm as the cam-cylinder is continued in its rotation with respect to the needle-cylinder, and the movement of the picker-arm will continue until the notch of the picker engages the end of the cam forming part of the cam-path. The needle will then pass from the notch in the end of the picker to the beveled end of the upper cam, and thus be guided to the upper cam-path.

To perform the usual operation of a knitting machine for forming the heel and toe of stocking or sock, the cylinder is provided with two pickers, one upon each side of the cylinder almost opposite to each other, as clearly shown in Fig. 2. The second picker is in all respects like the one already described. When the plate is moved to one extremity of its path, the pins will engage the inner ends of the slots and the pickers will be brought to their inner operative position. When the plate is carried to the opposite extremity of its movement, the pins will engage the outer ends of the slots and the pickers will be withdrawn from the cam-paths or moved outwardly from their operative positions. When the pickers are thus moved in their outer positions, the inner needle-engaging ends are drawn within the apertures, formed in the cylinder-wall, so as to be entirely beyond the point where they may be engaged by the heels of the needles. The pickers are thus moved entirely out of the way. The movement of the slide makes it possible to have a positive control over the action of the pickers and the length of the arms gives an easy movement to the free ends thereof which carry the pickers, so that it is easy to slide the plate back and forth when throwing the pickers into and out of operation.

The operation of the pickers is very simple. When they are moved inwardly by the action of the plate, drawing the ends of the arms inwardly, the end of first one and then the other of the rock-shafts will engage its respective detent, causing the arm to be moved to one side as the cylinder oscillates and the inner end of the picker will be depressed and brought to its position in the notch formed in the lower cam-path.

The continued oscillation of the cylinder will cause the heel of a needle to engage the notched end of the picker, and the picker will then elevate the needle as the cylinder moves, and as it continues its movement the heel of the needle will thus be carried to the end of the upper cam-path. The next oscillation of the cylinder on its return movement will cause the picker to be depressed again in readiness for engaging the next needle. This operation will continue until the slide is moved by engaging the lever, when the pickers will be withdrawn from their operative position and the depressing-picker will be thrown into operation.

The machine is first started in its rotary movement, having a continuous motion in one direction, so as to knit the leg and ankle of the stocking. At a suitable point a portion of the needles are elevated out of operation, and the slide is then moved into such a position as to bring the pickers inwardly to their operative positions. The cylinder is then oscillated, being moved back and forth for almost a complete revolution at every movement. The pickers will thus operate to elevate a needle out of operation first upon one side and then upon the other until the desired number of needles have been lifted out of operative position.

At this point the cam projection on the chain will raise the lever so as to temporarily engage the arm of the slide and move it to its other position for retracting the pickers. At the same time the slide is moved, so as to bring the depressor into operation, and the continued oscillation of the machine will continue the returning of needles to operative position. In this manner the heel of the stocking may be completed, after which all the needles are restored to their active position and the foot portion of the stocking is knitted. The toe is then constructed in the same manner as just described with respect to the heel, the stocking being thus completed.

A KNIT MUFFLER.

The construction of a knit muffler, recently patented in this country, is shown in the accompanying illustrations. It has an adjustable neck portion that can be taken up without making any change in the fastening devices. It has neck-yokes of the same material, each terminating in an extension

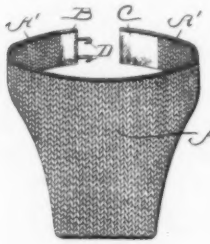


FIG. 1.

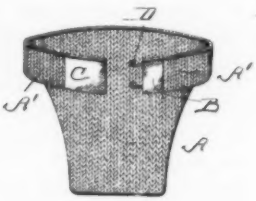


FIG. 2.

formed of woven cloth, with hooks to fasten the two together.

Fig. 1 is a front view of the muffler; Fig. 2, a rear view; Fig. 3, a plan view.

A indicates a muffler of knit goods having neck portions, A', of the same material. To the ends of each of these portions is secured a cloth extension, B and C, respectively. The extension, C, is preferably of greater length than the extension, B, and to the free end of extension, B, are connected hooks, D, which are adapted to engage and take hold of any portion of the extension, C.

The hooks, D, will secure a firmer hold upon a piece of woven cloth, as shown at C, than if they were engaged directly with the knit work of the portion, A'. As the hooks, D, can engage any portion of the length of the extension, C, the part, C, can overlap more or less the extension, B, thereby adjusting the muffler to the desired neck size and also taking up the stretch of the knit portions, A'.

Two years ago there were just six woolen mills at work in India with 737 looms and 25,931 spindles.

Australia collects a duty of 5 per cent. ad valorem on woolen yarn, and 5 to 25 per cent. on cotton, linen, silk and woolen goods.

A CIRCULAR KNITTING MACHINE.

The accompanying illustrations show parts of a circular knitting machine that has recently been patented in this country. The improvements consist of a new construction of the dial and arrangement of the cams, means for controlling the cams, and for adjusting the dial and dial-cap.

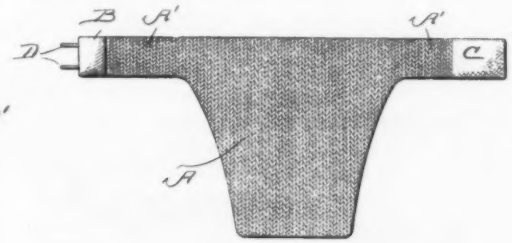


FIG. 3.

The more important features of the invention are the construction of dial-cap with a central cap-hub and a series of segmental sections which carry on their lower surface the cams of which the main or projecting

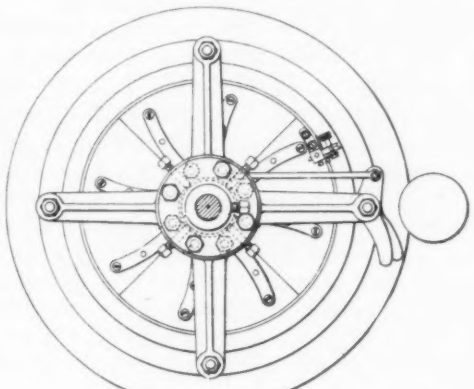


FIG. 1.

cams form a continuous ring of steel, so that the needle-butts come in contact only with the hard steel. Corresponding series of steel cast-off or retracting cams and of guard-cams are arranged one of each on each section, and a pivoted tucking-cam is arranged in a cut-out in the projecting-cam and adapted to adjust the needles in plain-knitting or in the tuck position.

A compound lever of peculiar construction is arranged on one of the yoke-studs, supported on the main gear-ring automatically to operate these movable cams and throw them from plain to tuck position, and vice versa. The primary lever of this com-

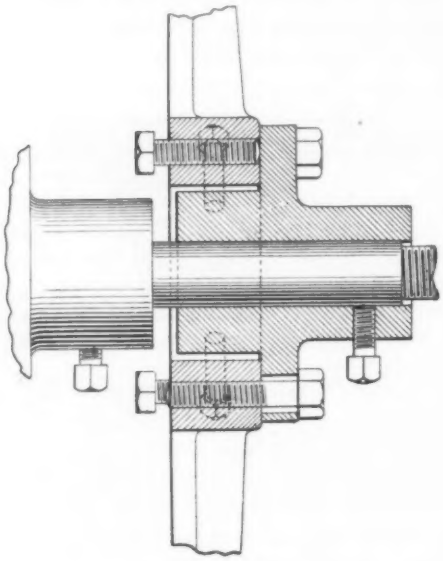


FIG. 2.

pound lever is connected by a single connecting-rod to the cam-shifting ring, fitted to an annular groove in the cap, and this ring is connected to each tucking-cam by a strap.

The dial and cam-cap carried on the yoke by the shaft are leveled and centered in the yoke-ring by an adjusting-hub fitting loosely in the ring and provided with a series of clamping-screws for fixing it in adjusted position. Fig. 1 is a top plan; Fig. 2, a vertical section showing means for adjusting the hub.

Transferring Rib Tops.

Editor Textile World Record:

On transferring 42/42 (1&1) rib tops on 84 quill rings for men's woolen socks, we find a knitter can do the work rapidly. On boys' leg work 84/42 (2&1) transferred to the same quill ring she makes but very little headway on account of the dial stitches, which have to be picked up one by one after the cylinder stitches are on, putting the dial stitches on the points afterwards. Isn't there some method used to hurry the work?

Kerry (728).

I have had operators who would do this work as rapidly as the 1&1 rib tops, but it must not be expected that a girl will transfer 84/42 or 126 stitches as quickly as 42/42 or 84 stitches; the fact that the dial stitches are picked up one by one after all the cylinder stitches are put on, makes the operation still slower.

In transferring the 42/42, 1&1 rib tops, the operator is enabled to stretch apart or open out the loops, which of necessity makes it easier for her to put them over the needles.

In the case of the 84/42, as there are 42 more stitches than there are needles, an operator is not able to stretch the work, thus leaving the loops partially closed as it were, and making it more difficult to put them over the hooks of the needles.

I can only suggest that the operator be taught to put on all the stitches as she goes along, that is to say, as fast as the two cylinder stitches are put on, follow with each dial stitch over every second needle.

Possibly this plan may be considered slower than the old way, and doubtless would be at the first trial or two. After some practice it might be found more rapid. Esek Easton.

I fear the knitter in charge of this work has not got the right idea as to how these stitches should be put on the quill ring. It should not be necessary to have any drop stitches to pick up if the knitter is a good topper or transferrer. The knitter should put one cylinder stitch on each quill and one dial stitch on every second quill. This would result in the following order: One cylinder stitch on the first quill; one cylinder and one dial stitch on 2d quill; one cylinder stitch on 3d quill; one cylinder stitch and one dial stitch on 4th quill; and so on all the way around the cylinder. This takes up all of the stitches. Dan Bucklin.

Stamping Ink.

Editor Textile World Record:

Please give me a formula for making a stamping ink for printing trade-marks on fast black hosiery. Thompson (745).

Dampen the stamping pad with a solution made of one pound of gum arabic dissolved in cold water. Sift zinc oxide (zinc white) on the dampened pad, care being taken that it is neither too dry nor too wet, and then apply the stamp to the goods to be marked. This is very simple but effective and gives a bright white color on fast black or on any other color where a clear white is needed. Of course there is no limit to the quantity of gum to be dissolved, but I make it with a pound at a time as that is a sufficient quan-

tity. I have used this formula for the last ten years and it is the best I have ever tried.

Milton.

There are various formulas used in different mills, but I am sending one that has given the very best satisfaction of any that I have ever tried. The formula is as follows: 4 ozs. of gum arabic, commercially pure, dissolved in 3 quarts of hot or boiling water. After this has become thoroughly cooled add oxide of zinc, until it is about as thick as heavy cream. Then put the mixture in a patent churn or ice cream freezer and mix thoroughly. The more it is mixed the thinner and smoother it will be. I think this will be found to give perfect satisfaction. Weehawken.

Yarn for Different Gauges.

Editor Textile World Record:

Kindly let me know the proper numbers of yarn, singles and lisles, that should be used with the different gauges of needles in circular machines to give the best results. Will a 240-needle 3 3/4-inch cylinder machine make as good ladies' hose as a 260-needle 4-inch machine? Morgan (700).

A 260-needle 4-inch cylinder machine will make a finer fabric than a 240-needle 3 3/4 cylinder machine.

To make a list of all the gauges for the single and two-ply yarn would take too much space. If Morgan will give some idea of the number of gauges he wants to know about I will try to answer his question. Thomas.

It is very difficult to give the numbers of the yarn, single and lisle, that should be used with the different gauges of needles in circular machines to give the best results. It depends entirely on the class of goods to be made with the different gauges, as there are different ways of manipulating the stitch and different weights of yarn in different gauges. The following will give a fair basis to work from:

Gauges	No yarn single.	Lisle or two ply.
12	8	16
14	10	20
16	12	24
18	18	36
20	22	44
22	26	54
24	30	60
26	36	72
28	40	80
30	45-50	90-100

I should prefer the 260-needle 4-inch cylinder to the 240-needle 3 3/4-inch cylinder, as the former will finish better and give a smoother and better feeling hose. Manufacturer.

Softening Yarn.

Editor Textile World Record:

Please give me some information about softening yarn for knitting. Williston (714).

I do not know of any method that will make hard twisted yarns soft. A solution of soft soap, oil and water is used in winding harsh yarns, so as to make them easier to knit, but this in no way softens the yarn; it only moistens and oils it so that it works freer on the needles.

All yarns for knitting purposes should be "soft" when spun, that is to say, soft twisted, while those for weaving require to be hard twisted. In order to have soft yarn for knitting it must be made that way in the spinning process by having as little twist in it as possible, just enough so it will stand the strain in winding.

Hard or harsh yarns are so owing to the amount of twist put in during the operation of spinning; in order to have soft yarns, less twist must be put in, but I know of no way of taking the twist out of yarn after it has been spun.

If the yarn kinks up in knitting, owing to the twist, this difficulty can be overcome by steaming, which merely sets the twist, but does not make the twist any less, nor does it soften the yarn.

A solution to be used in winding so as to moisten yarn that is hard and harsh, is made of two pounds of Bradford soap and 1 1/2 pints of softening oil, to which is added sufficient water to fill a 3-quart pail, and then boiled. I have found that yarn treated with this solution will run well when otherwise it would not run at all.

Lafayette.

Recent Knitting Patents.

KNIT MUFFLER. 828,967. Max Reichblum, Wheeling, W. Va.

KNITTING MACHINE. 827,367. Joshua D. Hemphill, Pawtucket, R. I., assignor to Mayo Knitting Machine and Needle Co., Franklin Falls, N. H.

KNITTING MILL NEWS.

New Mills.

Indiana, Fort Wayne. The Cramer Knitting Mills have been organized to operate a plant at this place, with capital stock of $150,000. They will make fine ribbed underwear for men, ladies and children. Geo. B. Cramer is secretary and manager of the company and W. P. Drumheller, superintendent. New York office is at 72 Leonard St.

Mexico, Torreon. It is reported that Missouri

capitalists are interested in the new hosiery and ladies' underwear mill being erected at this place.

New York, Brooklyn. A new plant will be started October 1, at 147 Scholes St., by M. Saldin. Ladies' and infants' ribbed underwear will be made.

*New York, Stittville. Work is progressing on W. T. Atwood's new knitting mill. It is expected to have the building ready to start operations by first of November, making gauze goods. Plant will have capacity of about 175 dozen per day.

New York, Utica. The Utica Knitting Company has let contract and work has started on erection of a new mill 100 by 60 feet, four stories, to be known as mill No. 6. Plant will have capacity of about 400 dozen garments daily. It is expected to have the new mill in operation by December 1.

*North Carolina, Selma. The Selma Knitting Mills have started operations in their new plant. R. S. Beavers is superintendent of this plant.

*North Carolina, Vaughan. Work is well under way on the Vaughan Hosiery Company's new mill and the machinery will soon be installed.

*Pennsylvania, Bernville. The Durable Hosiery Mill is to be the name under which D. K. High will operate the branch mill started here. This plant is equipped with 20 "Mayo" machines, making half hose. Walter V. R. High is president of the company.

Pennsylvania, Philadelphia. The Chris. J. Sutphin Knitting Co., which recently filed papers of incorporation in New Jersey, with a capital of $150,000, will manufacture hosiery and, it is said, will start its operations in this city. The active members of the company are Dr. Jermon, 3022 Ridge Avenue, John Hargrove, 2830 D Street, and Chris. J. Sutphin, 3131 F Street, a brother of John L. Sutphin, proprietor of the Enterprise Hosiery Mills in Wilmington, Del. The two latter parties are now employed in knitting mills in this city.

*Pennsylvania, Spring Forge. The Pennsylvania Knitting Mills Company has been incorporated with capital stock of $10,000.

Washington, Seattle. The German American Knitting Factory has been incorporated with capital stock of $100,000 and expects to manufacture underwear, socks and sweaters in pure wool for the northern trade. H. W. Schoebel is president and manager of the company; M. Cameron, secretary and C. C. Filson, treasurer. They will continue the plant started by H. W. Schoebel, making men's and ladies' sweaters, hunting jackets, lumbermen's socks, etc., under the above name.

*Wisconsin, Ashland. The Ashland Knitting Mills, recently reported incorporated with capital stock of $10,000 have leased a building temporarily and will start operations October 1. They will manufacture high grade family hosiery, worsted and cashmere, operating 6 knitting machines, 4 loopers and 4 ribbers, using gasoline as power. Product will be sold direct. C. N. Cramer is president of the company; C. F. Latimer, treasurer; and J. M. Danker, secretary and general manager.

Enlargements and Improvements.

Connecticut, Plainville. Work has been started on foundations of an addition to the Plainville Knitting Mill.

*Delaware, Wilmington. Contract has been awarded for the erection of the Delaware Hosiery Manufacturing Co.'s new three story building.

*Michigan, Lexington. John L. Fead & Sons, whose yarn mill, knit goods finishing plant and office were destroyed by fire, advise us that they have secured finishing machinery and are finishing knit goods. The knitting plant was not affected by the fire. Will buy yarn for the balance of the season and will then erect a new yarn mill, installing best equipment.

*New York, Broadalbin. Work is progressing on the new building for the Broadalbin Knitting Mill, the roof now being put on. Machinery will be installed as soon as the building is ready.

*New York, Oneida. The Oneida Hosiery Co. has removed the plant to the new building on Liberty St.

New York, Perry. The Perry Knitting Mills have placed order for new machinery which will equip the plant with a total of 11,000 cotton spindles and 2,180 woolen spindles.

New York, Phimont. Operations will be resumed shortly in the McNamee Mesh Knitting Co.'s plant, under re-organized name of the Columbia Mesh Knitting Co. Repairs and necessary changes are being made in the plant. J. F. Gangleff will be manager and superintendent of the plant.

*New York, Utica. The Utica Knitting Co., making an addition to its Mill No. 2, has placed all contracts for labor and material.

*North Carolina, Burlington. The Burlington Hosiery Mill Co. has been incorporated with capital stock of $100,000; G. W. Fogleman is president and treasurer of the company and R. H. Whitehead, superintendent. An addition is being built to the plant and 40 more knitting machines will be added, giving a total of 90 machines on men's and women's hosiery. The above company has been organized to continue operating the Burlington Hosiery Mills.

North Carolina, Tarboro. The Wah Rhee Knitting Mills have recently established a branch plant at Enfield, in the same state, which they are equipping with knitters for the manufacture of half hose.

Pennsylvania, Langhorne. The United States Silk Knitting Co., manufacturers of silk hosiery on 5 full fashion machines, have recently added a dyeing plant to their establishment and are now able to dye and finish their own goods before putting them on the market.

Pennsylvania, Philadelphia. The Saxony Hosiery Co., formerly located at 2507 Potter St., have removed their entire plant to the new mill recently erected by the Pine Tree Silk Mills at the S. E. corner of Allegheny Ave. and Boudinot St. They operate 145 knitters on plain cotton and split sole hosiery and half hose selling through New York.

Pennsylvania, Philadelphia. The Allegheny Hosiery Mills, now at 1931 Hope St., manufacturers of cotton and lisle flat and ribbed misses', infants' and ladies' hosiery on 75 knitters, are removing their plant to the Bromley Mills at Jasper and York streets. They sell direct and through New York.

Pennsylvania, Reading. The Pennsylvania Knitting Mills are adding a machine shop to the plant for doing their own repairing.

Mills Starting Up.

*North Carolina, Selma. The Selma Knitting Mills, which have begun operations, will install a dye plant later.

New York, Amsterdam. It is reported that the Van Brocklin & Stover Company are about to start up their No. 3 mill, formerly known as the McDonnell Mill and which has been shut down for some time. The power will be furnished by the Hudson River Power Co.

New York, Waterford. The Ford Manufacturing Co., which has been closed for two weeks, during which time repairs have been made, has resumed operations.

Mills Shutting Down.

Massachusetts, Farley. The knitting mill has been closed for one week.

Pennsylvania, Philadelphia. Ackerman & Bros., proprietors of the Excelsior Hosiery Mill, Mascher and Oxford Sts., have suspended operations.

Facts and Gossip.

Alabama, Athens. It is reported that the Athens Knitting Mill is to be removed to Trenton, Tenn., where Mr. Smith, the proprietor, has purchased the spinning mill.

Georgia, Villa Rica. The project of establishing a cotton mill and a knitting plant at this place is under consideration.

Maine, North Brooksville. Grace M. Limeburner of this place is interested in starting a small knitting factory for manufacturing hosiery, mittens, sweaters, etc.

New York, Albany. It is reported that the Fuld & Hatch Knitting Co. is having plans prepared for a new knitting mill, to be built of cement.

*New York, Philmont. The Columbia Mesh Knitting Co. has been organized with capital stock of $30,000 to continue the plant formerly known as the McNamee Mesh Knitting Co. P. Hocker is president and treasurer of the company and J. F. Gangloff, superintendent. They will start operations about November 1st, making men's mesh knit shirts and drawers in summer weights, operating 12 knitting and 30 sewing machines. Product will be sold direct.

New York, Poughkeepsie. The Highland Knitting Mill has been incorporated to operate a knit goods plant at Highland. John K. Mueller will be superintendent of the plant.

Pennsylvania, Coopersburg. The Gabriel Hosiery Company has been incorporated with capital stock of $20,000. M. S. Gabriel, R. A. Young, Willis R. and Wilson F. Jordan are interested.

Pennsylvania, Gouglersville. Preparations are reported being made by James K. Hartmann for building a hosiery mill at this place.

*Pennsylvania, Philadelphia. Thomas J. Litle, individually and late trading as the Continental Knitting Mills, has applied to the U. S. District Court for his dismissal as a bankrupt. The Continental Knitting Mills, mentioned in this item, were formerly conducted at Howard and Harrison Streets, with Mr. Litle as the proprietor, the failure of the plant taking place about ten years ago, after which they were consolidated with and now form part of the Leicester Continental Mills of Germantown. Mr. Litle is now connected with the Royal Waist Lining Co., at Front and Oxford Streets, extensive cutters up and manufacturers of garments from both knitted and woven fabrics and states that it is his intention, if this discharge from bankruptcy is granted, to again put in machinery for the manufacture of the knitted fabrics, turning out the cloth for their own use.

Pennsylvania, Philadelphia. The knitting plant established by George F. Jones & Son, at 866 and 868 Pallas St., West Philada., and which they shut down three years ago, is still idle. It is not known whether the proprietors intend to start it up again or not as they continue to renew their lease from year to year and are making no effort to sell it to other parties. They are now engaged in the manufacture of automobile tires in Washington, D. C. The plant is equipped with 25 knitters, finishing machinery and a gas engine. The knitting machinery was formerly run on fine gauge ladies' hose, silk finish.

Pennsylvania, Reading. The Colonial Hosiery Mill was reported damaged by fire recently. This is incorrect, as it was the Rainbow Hosiery Mill in which the fire occurred; was slightly damaged by smoke.

Texas, Fort Worth. It is reported that a knitting plant is in contemplation at this place and that new buildings will be erected for the purpose.

*Wisconsin, Onalaska. The Onalaska Woolen Mfg. Co. has moved its knitting plant to 1900 George St., La Crosse, Wis. By another season they expect to move the balance of the plant to the same location and add another set of machinery. The officers remain the same with the exception of the president, who is Geoge H. Kay, La Crosse, Wis.

Personals.

Thos. P. Griffin, who has been employed by Chas. Cooper of Bennington, Vt., for the past six or eight years, has been engaged as overseer of knitting for the Monarch Underwear Company of Bowling Green, Ohio.

H. O. Witherall of Des Moines, Ia., has accepted the position as superintendent for the Fay Stocking Company, Elyria, Ohio.

A. L. Bassett, for several years superintendent of the Jonesville Mfg. Co., Jonesville, S. C., has accepted a similar position with the Goldsboro Knitting Mills, of Goldsboro, N. C.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

Spinning Spindle. John MacGregor, Springfield, Mass., is introducing an improved spinning spindle which is now in operation in the Benneft Mills, at New Bedford.

Expansion Comb. Sachsischen Webstuhlfabrik, Chemnitz, Germany. An improved expansion comb for beamers.

Feed for Heilmann Comb. Elsassischen Maschinenbau-Gesellschaft, Mulhause, Germany. An improved feed for the Heilmann comb, which is said to give very uniform results.

Brake for Faller Motion. Societe Anonyme Vervietoise, Verviers, Belgium. A brake for fallers on self-acting mules to ease the motion and prevent the breaking of the yarn.

Fulling Mill. L. Ph. Hemmer, Aachen, Germany. An improved method of driving fulling mills and washers. The improvement consists in means to stop the machine automatically when the goods become tangled during the process of fulling or washing.

Tenter Clip. James Riley & Co., Manchester, Eng. An improved tenter clip adapted for both heavy and light fabrics. The cloth is held between an upper clip and a lower fluted roll.

Woolen Mule. Taylor, Lang & Co., Stalybridge, Eng., have recently placed on the market an improved woolen mule. One of its features is three spindle speeds.

Harness Hook. Robert Hall & Sons, Bury, Eng. An improved harness hook which it is said greatly facilitates the work of hanging the warps on dobby looms.

Drop Box Motion. C. & W. W. Peck, Manchester, England, have recently brought out an improved shuttle drop box motion, which they have named the "Manchester."

Tension for Beaming Machines. Wm. Bottomley & Sons, Manchester, England. A device to prevent slack sides when beaming yarn. It consists in making the top carrier roll in two parts supported in the middle by a flexible bearing. As the yarn passes over the roll the inclined surface caused by the depression compensates for the variation in the tension of the threads from the creel.

Cloth Press. Albert Keller, Dorian, Mulhause, Alsace. A corrugated cylinder for pressing textile fabrics and producing a lustre similar to that of silk. The improvement consists in the form of the corrugations, which it is claimed reflect the light in such a way as to produce an especially high lustre.

Oiler for Wool. Gebruder Koerting, Koertingsdorf, Hannover, Germany. An improved machine for oiling wool at the mixing picker.

Improved Creighton Opener. Howard & Bullough, Accrington, Eng., recently brought out a "Creighton" opener that embodies many improvements.

Wire Machine Guards. Johnson, Clapham & Morris, Manchester, Eng., recently brought out a line of wire machine guards of novel design and construction.

Steaming Machine. John Wood, Ramsbottom, Eng. An improved steaming machine for printed fabrics.

Picking Mechanism for Looms. Alexander Pringle, Bury, England. A positive picking mechanism for looms, which is said to be working very satisfactorily in England upon heavy fabrics. Among the advantages claimed are a saving in power, being able to weave any width of cloth, absolute control of the shuttle, noiselessness and low cost.

MECHANICAL FILTRATION.

The mechanical filters manufactured by the United Water Improvement Co., Pennsylvania Building, Philadelphia, Pa., have been designed by one of the most experienced filtration engineers in the country and represent the highest type of the apparatus that his experience could evolve. Their object is to remove all suspended matter, color, dyestuffs and industrial wastes from the water. Filtration is downward in all cases and specially prepared sand constitutes the filter bed. Washing is effected by simply reversing the flow supplemented in the gravity filter by rotating the wash rake.

An important feature of the system and one that is under the direct control of the United Water Improvement Co., is a device that prevents the strainer system from becoming choked and thus causing the filter bed to be filled with mud. Most of the failures of filters result from stoppage of the strainer system, but it is said that the methods adopted by the United water system to prevent this difficulty are so efficient that unfiltered water can be used with perfect safety for washing the filters. Alum or other suitable coagulant is used when required and a guarantee is given that there will be less than one grain of alum in three barrels of the filtered water when alum is used. This is an important consideration in the dyeing process.

Fig. 1 shows a 300,000-gallon pressure filter plant in the dye house of Firth & Foster, Philadelphia. The pressure filter is applicable to all small plants where the water supply is delivered under pressure. The gravity filter is shown at Fig. 2 with the side removed to show the working parts.

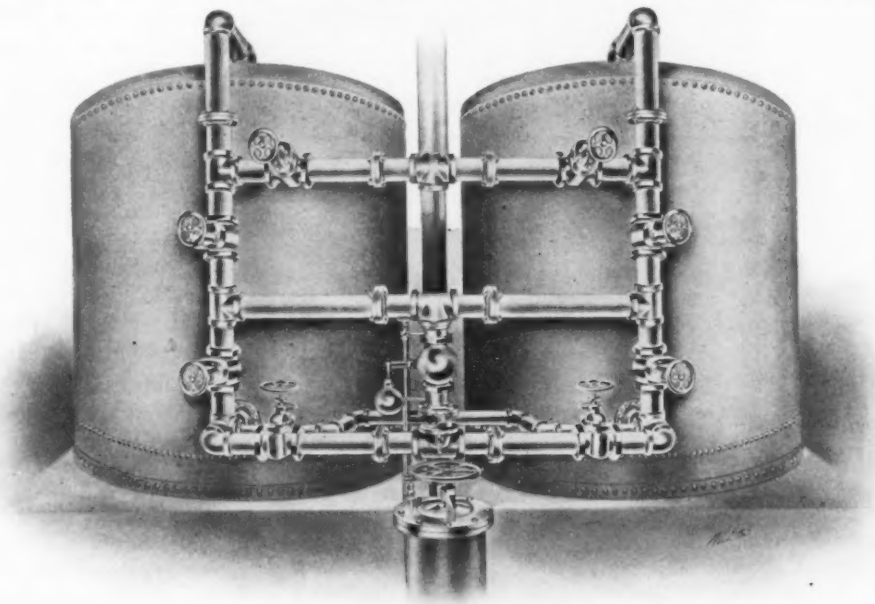


FIG. 1.

Among the advantages claimed for these filters are that there are no screens to choke up; there are no long lines of small pipe to retard the flow of the water; they have a strainer system that will not become choked by continuous use; they wash perfectly in three minutes by the simple reversal of the flow; they always give crystal clear water and fulfill the guarantee in every case; they never require renewal of the filter bed and they are unexcelled for durability.

In addition to the filters this company manufacture water softening apparatus of

both the continuous and the intermittent type, the difference between the two types being in the manner of adding the chemicals. In the intermittent type they use large tanks holding several hours' supply, in which predetermined amounts of lime and soda are placed and the tanks filled with raw water.

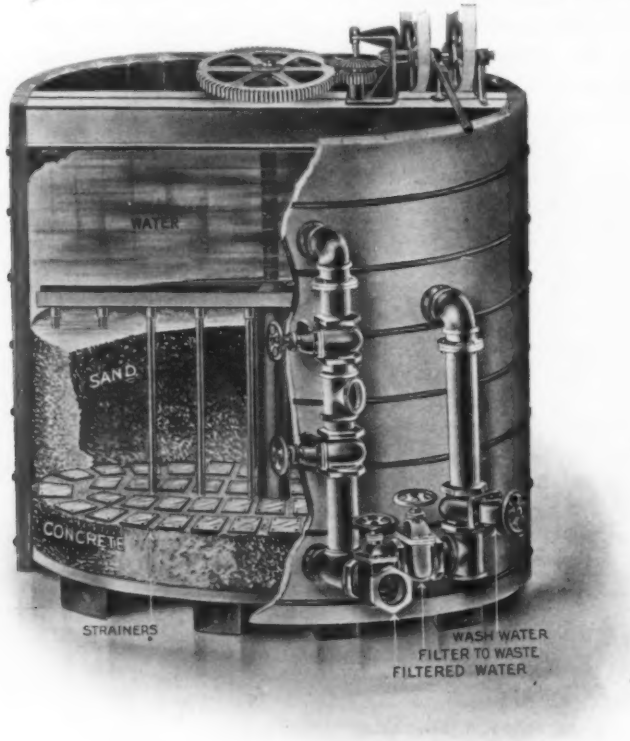


FIG. 2.

The chemicals in the water are then mixed by agitation, and the water is left for a period of time at rest to permit the precipitated lime to subside. The water is then passed through a mechanical filter and is softened by the process to about three degrees of hardness in nearly all cases.

In the continuous apparatus the chemicals are applied as the water flows in, an exact proportion being maintained between the chemicals and the water regardless of the rate of flow. The results obtained by each process are practically identical, but they usually recommend the intermittent apparatus for plants of 50,000 gallons or less daily capacity, and the continuous apparatus for plants exceeding this amount, although this depends largely upon local conditions. Simple test solutions are furnished to determine the correct amount of chemicals, so that any person of ordinary intelligence can operate the apparatus.

According to Poor's Railway Manual there were 23 miles of railway in operation in the United States in 1830; in 1904, 212,349 miles, not including double tracks, sidings or spurs.

The cost of the material used in the four leading industries of the United States are: food products, $1,837,668,260; iron and steel, $987,198,370; textiles, $895,984,796; lumber, $561,410,619.

SUITABILITY OF LUBRICANTS.

The requirements of a good lubricant are commonly stated as the following:

1. Sufficient body to keep the surfaces apart under conditions of maximum pressure. 2. The greatest possible fluidity consistent with the necessary "body." 3. The lowest possible coefficient of friction in actual service. 4. Maximum capacity for absorbing and carrying off heat. 5. Freedom from any tendency to oxidize or gum. 6. Absence of acid or other corrosive ingredients and freedom from gritty matter. 7. A high "flash point," or temperature of vaporization and a low congealing or "freezing point."

Thurston in "Friction and Lost Work" includes one more specification. He requires that there shall be "special adaptation to the conditions as to speed and pressure of rubbing surfaces, under which the unguent is to be used." The significance of this last requirement is often overlooked. The products of any reputable maker of lubricants may be accepted without fear of their containing grit or corrosive acid, or of their having a large content of gumming or oxidizing oils. All mineral oils are free from any tendency to gum although tallow greases have often been observed to leave gummy deposits in bearings, perhaps due to the residue of soaps or decomposition of fats. As to flash points and freezing points, any engineer can make a reasonably accurate estimate of these without trouble. Sufficient body is evident if a bearing will not run hot under a lubricant. This leaves three requirements to be discussed—the greatest possible fluidity, lowest possible frictional coefficient and this matter of adaptability. The only possible way to determine how thin an oil may be is to try it and see. The thinner the oil or grease, the less its viscosity or body, and the less will it retard the motion of the lubricated surfaces. If a layer of lubricant is interposed between two metal surfaces and is thick enough to separate them completely, whatever friction remains is the friction of the different particles or layers of the lubricant one upon another, the fluid friction, or internal friction of the lubricant as it is often called. It is evident that to keep a given bearing as cool as possible, there must be an adjustment of the body with fluidity.

Closely related to these requirements is the quality of suitability or adaptability. Actually, every bearing presents certain differences from every other bearing, even similar ones, albeit these differences are often microscopic. Only careful study will determine how few lubricants should be kept on hand to reduce friction to the lowest.

While it is of prime importance to prevent overheating, wear and tear and failure due to lack of proper lubrication, it is fair to assume these things as accomplished in any well-regulated plant or factory.

Most men do not realize that every bearing developing considerable friction does not necessarily heat up. Sometimes a draft of air keeps it cool; sometimes a copious supply of oil carries off the frictional heat. But all that friction means lost power and fuel and increased wear. Hence the importance of this matter of suitability.

Just because an oil or a grease keeps a bearing reasonably cool is no final proof that there isn't another lubricant that will let it run even cooler. Some bearings run perfectly cool on grease, but there exists abundant evidence proving that grease-lubricated bearings consume more power than the same surfaces lubricated with oil, the explanation being the greater viscosity of the grease. There is, however, a class of lubricants known as non-fluid oils in which the cleanliness of grease has been attained without the objectionable increase in viscosity and without the retarding action so frequently reported in the case of grease lubricated machinery.

Suitability means more than the mere selection of a lubricant that will keep the friction at the lowest possible point. It often happens that there are other considerations far more important than friction, and these are related either to the means of, or opportunity for, applying the lubricant, or to the difficulties and damage arising from the presence of oil on floors, walls, goods in process of manufacture, etc. In such cases, cleanliness must first be attained, and after

that low friction, or else the lubricant is not suitable. There are many of these special applications where the general rules and fundamental principles have to be set aside for reasons of still greater importance. Sometimes, in cases where oil stains must be avoided, animal oils are employed because of the ease with which they can be washed out compared with mineral oils. Sometimes greases are used with a measure of success. Non-fluid oils cover cases of the sort mentioned, and the degree to which they are rendered non-fluid is governed by the requirements of the case. It is possible to obtain almost any density or body.

Perhaps the main thought to be emphasized in discussing the matter of suitability of lubricants is for the user or buyer not to rest satisfied with a lubricant until he has studied the matter out with scrupulous care from every point of view.

The cost of lubrication is not merely the cost of the lubricant, but the cost of labor, repairs, damage (if any) and friction accompanying its use. To be able to reduce friction two or three per cent. in a plant of any size may pay many times over for difference between the cheapest lubricants and the dearest. To lessen a fire risk or damage to manufactured goods through dripping and spattering oil, it is well worth while to spend time and trouble finding the right lubricant that combines dripless properties with low friction. To the man who simply knows that "oil is oil and grease is grease" and, as long as you get enough of either on a bearing, and have no trouble, all is well, these remarks have no direct message, unless to help open his eyes to greater possibilities.

To the engineer who is anxious to show results and to "stop leaks" wherever possible, the writer's earnest advice is not to rest from experiment or trial until he has found suitable lubricants for the machinery under his care and proved their suitability.

G. P. H.

According to the census of 1900 there were over ten million foreign born inhabitants in the United States. Of this number over four million came from the United Kingdom and Germany.

A NEW PROCESS OF PRODUCING LAPPET PATTERNS.

By a process for producing this class of woven designs, recently patented, the loose ends are brought to the back of the fabric. In his description of the method the inventor states that heretofore in the production of isolated lappet figures in woven fabrics the portions of the lappet-threads which are not woven into the fabric extend as free threads over the face of the fabric from one figure to the next in each series, and subsequently these free lappet-threads are severed closely to the sides of the lappet figures. However closely cut the severed ends project from the figures and appear as a disfigurement upon the face, giving it an unfinished ragged appearance. The improved method is intended to obviate this objectionable feature.

Fig. 1 shows the face side of a fabric with lappet figures produced in the old way; on the lower part of this piece the free portions of the lappet-threads have been severed at each side of the lappet figures. Fig. 2 shows the back of Fig. 1. Fig. 3 shows the face side of a fabric with the lappet figures having the severed ends projecting at each side; Fig. 4, the back of the same fabric with the floating threads looped under the lappet-threads according to the improved method. Fig. 5 shows the face of a fabric with the severed ends of the lappet figures pulled through to the back by the floating threads, and Fig. 6 shows the back of a fabric having the severed ends of the lappet-threads pulled through.

The several parts are designated as follows: F, the fabric; L, the lappet figures; a, the free portions of the lappet-threads extending between the figures; s, the severed ends of the threads; b, the floating threads, which are looped into the lappet-threads at either side of each figure. In Fig. 6 the severed ends, s', are upon the back of the fabric, and in Fig. 5 will be seen the complete and finished lappet figures produced by the improved method.

It is adapted for ordinary lappet-loom with dobby attachment, the floating threads being woven or looped into the lappet-threads only at each side of the several lappet figures and upon the side of the fabric

opposite to such figures by raising all the warp-threads employed in weaving the ground fabric and lowering all lappet-threads between the lappet figures upon the face of the fabric are severed by shearing or cutting in the usual manner, and after these

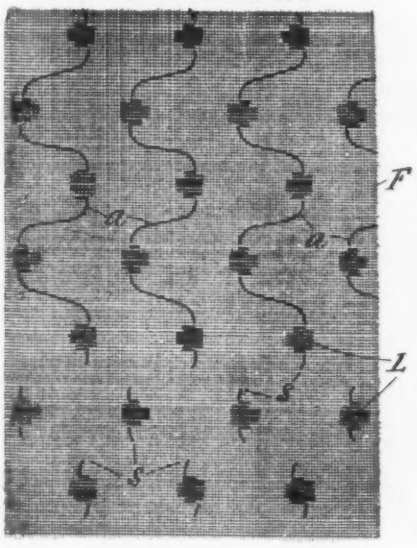


FIG 1

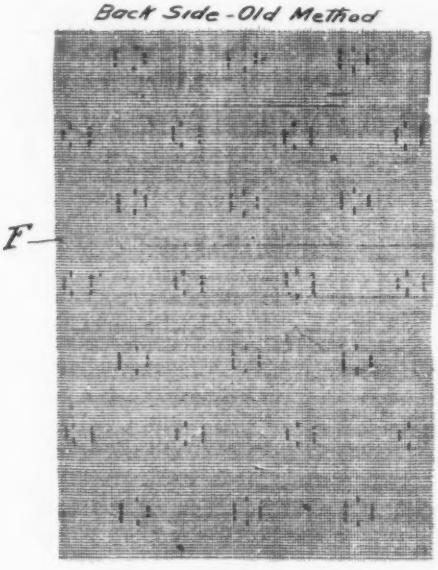


FIG. 2.

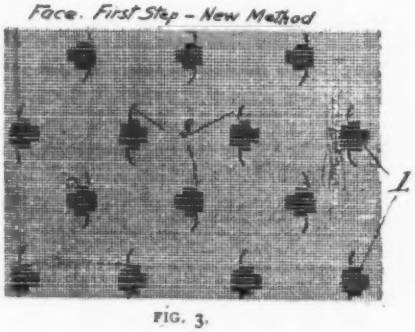


FIG. 3.

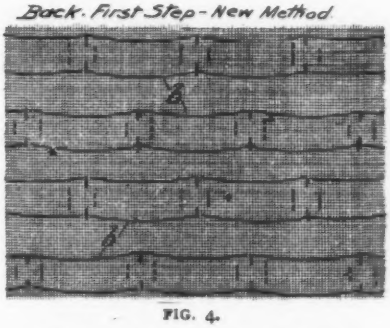


FIG. 4.

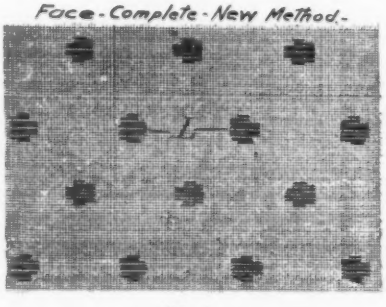


FIG. 5

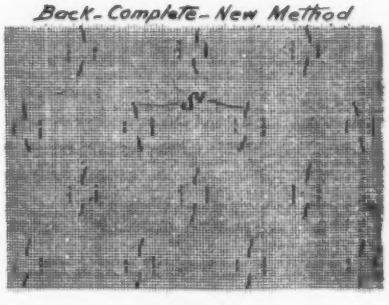


FIG 6.

threads which are employed in forming the lappet figures. After the weaving the free threads are severed the ends are drawn through to the back of the fabric by pulling

upon the interwoven floating threads with a hand-card, a rod, or any other suitable implement.

AN IMPROVED KNITTING NEEDLE.

An improved knitting machine needle, shown in the accompanying illustrations, has recently been patented and the patents assigned to Charles Cooper, Bennington, Vt., the well-known manufacturer of knitting machines and needles. Fig. 1 is a side elevation; Fig. 2, a section of the needle. The

FIG. 1.

FIG. 2.

butt of the needle extends across the shank and is bent to form a reverse curve. The curved portion terminates at one end in the shank at the bottom. The jack is provided with a slot, formed to receive the curved butt.

The back edge of the jack is cut away so that the rear edge of the lower part of the jack and the rear edge of the needle are brought into alignment. In attaching the needle to the jack or in detaching it the needle is moved laterally with relation to the side faces of said jack, and it is thus impossible to separate the needle from the jack by moving it in the direction of the arrow, Fig. 1, or to attach the needle to the jack by moving the same in a direction opposite to that of the arrow, so that the needle is firmly locked to the jack when located in the grooves or tricks of a knitting-machine.

It will be noted that the lower edge of the slot in the jack projects upwardly at its back end above the bottom of the butt and bears against the end and back side of the curved portion of the butt, forming a support for the shank, which greatly strengthens the needle at this point and tends to hold the shank firmly pressed against the back edge of the jack.

The advantages of the new needle are summarized as follows: The curved formation of the butt where it adjoins the shank, and also in the other curved portion are not sufficiently abrupt to cause the metal to become crystallized either in the manufacture of the needle or in its subsequent practical use. The needle is firmly locked to the jack. effect, a spring which holds the shank of the The curved formation of the butt forms, in needle firmly pressed against the butt of the jack. The length of the butt of the needle is not necessarily of exactly the same length as that of the slot in the jack, so that extreme accuracy in the length of the butt or in the distance at which the end of said butt terminates from the shank is unnecessary.

A CORRECTION.

Editor Textile World Record:

Through an error one of our recent advertisements read, that an Eastman electric cloth cutting machine would produce more accurately cut garments in one day than ten long knife cutters in the same length of time. In order not to appear in a false position, we take this method of advising the many readers of this publication, that although our machine cuts from three to four times as fast as a long knife cutter, it does not cut ten times as fast.

Eastman Machine Co.
Buffalo, New York.

Dyeing, Bleaching, Printing, Etc.

COMPARATIVE COST OF FORMIC ACID IN DYEING.

Dr. Walther has recently published an article on the use of formic acid in dyeing. He concludes with various estimates of the cost of dyeing, employing formic acid on the one hand and sulphuric and acetic acids on the other. These calculations create the impression that it is only in the rarest cases that formic acid can show any advantage, and very often costs more than sulphuric or acetic acid. I consider this as an error detrimental to practical dyeing. I have closely studied the question of the use of formic acid in dyeing and printing, and am still following up the matter. As, therefore, I have practical experience of the subject, I feel it my duty to supplement and correct Dr. Walther's pronouncements.

If we consider Dr. Walther's estimates of cost more closely, we find that they are to the disadvantage of formic acid only, as compared with sulphuric acid. Now, no one would dream of using formic acid in cases where the cheaper sulphuric acid gives perfectly satisfactory results, or of recommending others to do so. Thus we must use sulphuric acid in all dyeings begun with acetic acid, and finished with sulphuric acid or sodium bisulphate, and only replace the acetic acid by formic. Of these two, the latter is actually the cheaper. Had Dr. Walther done this, as every practical dyer does, the whole of his estimates would have turned out in favor of formic acid. For the convenience of the reader I will contrast Dr. Walther's calculations with those corresponding to practical dyeing operations. I have used the same prices as Dr. Walther, although it is certain that in actual working 85 per cent. formic acid at $16.50 can be used instead of 90 per cent, at $17.50.

According to Dr. Walther, to dye 220 pounds of wool with Diamine Black F5, we require:

5.50 lbs. of 30 per cent. acetic acid,	$.134
2.25 lbs. of 60 B sulphuric acid ..	.016
275 lbs. of bichromate of potash ..	.169
	$.319

Compare this with the following:

1.1 lbs. of 90 per cent. formic acid,	$.088
2.2 lbs. of sulphuric acid	.016
2.2 lbs. of bichromate	.135
	$.239

There is a saving of about 33 per cent. effected by using formic acid.

If Dr. Walther's other calculations are similarly altered as this has been, i. e., by substituting formic acid for acetic acid, the cost with formic acid always comes out much less than with acetic acid, and the difference is, of course, greater the more acetic acid is required.

Formic acid has advantages independent of cost, as for example in the fastness of the dyeings, as Dr. Walther has shown with a large number of dyes. Again formic acid exhausts the baths much better than acetic acid, whereby dye is saved. Dr. Walther also mentions the experience of a manufacturer who found that carded wool dyed with formic acid was the easiest to work.

If Dr. Walther thinks that formic acid does not equalize so well as acetic, his opinion is founded upon the effects of adding 85 per cent. formic acid to the dye bath. If the acid is diluted to 30 per cent. before putting it in there will be no risk of unlevel dyeing. Formic acid would otherwise not be so extensively used.

It is remarkable that Dr. Walther has entirely omitted one important application of formic acid from his calculations, viz., its use as an auxiliary with a chrome mordant. I will supply the omission.

½ lbs. of tartar	$0.72
6½ lbs. of bichromate	.40
	$1.12

With formic acid the cost is:—

3.3 lbs. of formic acid	$0.24
3.3 lbs. of bichromate	.17
	$0.41

A difference of 180 per cent. in favor of formic acid, to say nothing of the saving in steam, time, and water effected in consequence of the perfect exhaustion of the bath. Moreover, as less bichromate is then required the use of formic acid keeps the wool from injury, and makes it spin better. The B. A. & S. F. has issued a special pattern sheet of dyeings with formic acid in a single bath. The firm has shown that in the machine dyeing of carded wool with Alizarine Black WX Extra, formic gave better results than acetic acid in respect of levelness of dyeing and ease in rinsing. Cassellas prefer formic acid to acetic acid in dyeing with Anthracene Chrome Black.

Formic acid has fared like all novelties. Many experiment with it; some are successful and keep their success to themselves. Others are not successful and reject the product, proclaiming on the housetops that it is worthless, whereby many would-be experimenters are frightened away from it. Others, moreover, and they are too numerous, will have nothing to do with anything new, and will look at nothing that has not many years' reputation at its back. Open statements, whether for or against, are to be desired. They put the question in various lights, and are powerful incentives to fresh research. As, however, the successful have nothing to gain by publishing their experiences, they will always be less willing to speak, and the unsuccessful will always command a majority of the opinions expressed. —Dr. S. Kappf, in Leipziger, Monatschrift fuer Textil-Industrie.

The exports of linen yarn from Belgium are estimated at 18 million dollars annually and raw flax at 16 million more.

In India in 1905 there were 196 cotton mills in operation, containing 48,440 looms, and 5,230,068 spindles, employing a daily average number of 196,369 persons.

DISTINGUISHING MERCERIZED AND UNMERCERIZED COTTON.

The English Society of Dyers and Colorists recently offered prizes for papers on methods of distinguishing mercerized and unmercerized cotton. But one paper was submitted. An abstract and the report of the examining committee follow:

PROPOSED METHOD.

The following solutions are prepared:—

Solution No. 1.

5 parts potassium iodide are dissolved in
16 parts water, and
½ parts iodine are added.

The iodine readily dissolves.

Solution No. 2.

25 parts chloride of zinc are dissolved in
12 parts water.

Solution 2 is now stirred into Solution 1 until iodine begins to separate. After allowing to settle, the clear, dark brown solution is decanted from the sediment.

In order to carry out the test, a portion of the solution is placed in a porcelain dish, and the material under examination, along with a bit of mercerized and one of unmercerized cotton, are immersed. The samples are pressed beneath the surface by means of a glass rod, and kept immersed for two to three minutes. As a rule they wet out easily and assume the brown color of the solution. The samples are now removed to a porcelain dish filled with distilled water (which has previously been boiled and cooled), and in this they are washed until the brown iodine solution has been removed. The samples will now exhibit a dark blue-black color. They are allowed to lie under water. In case the sample under examination was not mercerized, decoloration rapidly ensues (as a rule in from two to five minutes). Mercerized material, on the other hand, will retain its blue-black color for as long as one hour. On exposure to the air, the samples bleach rather rapidly, whether mercerized or not, in consequence of oxidation of the iodine, and for this reason it is necessary to leave the samples immersed in water. Cotton mercerized in the ordinary way (with caustic soda at from 42° to 64° Tw.) shows the reaction

very distinctly. If weaker lyes have been used for mercerizing, the decolorization takes place more rapidly; the color of the sample is also lighter.

With the object of determining the degree of mercerization, the author prepared a series of standards of cotton cloth mercerized under tension with caustic soda, the strength of which increased in each case by 5° Be. from 0°-35° Be. When these were submitted to the test they could easily be distinguished by the shades of blue-black which they assumed. By means of these standards it is easy to ascertain by colorimetric comparison the degree of mercerization, if the sample and standards are treated simultaneously in one and the same iodine solution.

If the sample is dyed it is previously bleached with bleaching powder, hyraldite or rongalite. Many colors can be bleached by treatment with permanganate of potash (3/10 per cent.). The dyed sample is steeped in this solution at 95° F. for five minutes, when it becomes brown in consequence of the separation on the fibre of peroxide of manganese. It is then washed and immersed either in a solution of sulphurous acid or of bisulphite of soda until the peroxide is removed. These operations are repeated until the color is removed. When the permanganate bath has been used three times it should be renewed. The author has not hitherto come across any black color which would withstand this action. It is not advisable to use stronger permanganate in order to force the bleaching, as this involves injury to the fibre. After bleaching the sample is tested and compared with the standards in the usual way.

Cotton treated with nitric acid showed that mercerization began at 71.5° Tw., while at 74° the change was very marked. Cotton treated with sulphuric acid up to 119° Tw. did not show the test for mercerized cotton, nor did it show any increased affinity for direct colors.

REPORT OF COMMITTEE.

The competitor's proposal is a variation of observations of long standing that coloration by iodine is a property of hydrated celluloses, leaving out the question as to how far hydration means hydrolysis. The test as suggested is essentially the same as that proposed by Dr. H. Lange at the Fifth International Congress of Applied Chemistry, held in Berlin, 1903 (Report, Vol. II., p. 916), and consists in steeping the material to be examined in a solution of iodine in potassium iodide and zinc chloride, and then observing the rate of decolorization of the sample when immersed in distilled water.

"We have carefully repeated the experiments on Egyptian yarn mercerized with and without tension at the ordinary temperature with caustic soda at 10°, 20°, 25°, 30°, 35°, 40°, 45°, 50°, 55°, 60°, 65°, and 70° Tw. The result corroborates the well-known fact that mercerization begins at about 20° Tw. However, we found in repeated experiments that the permanence of the blue coloration was no criterion for the strength of the caustic soda used for mercerization, and we were unable to apply the test for this purpose. On the contrary, different experiments with the same samples of cotton showed different results.

"We are of opinion that although the competitor deserves credit for his attempt, he has not succeeded in satisfactorily solving the problem at issue, and recommend that the prize be not awarded."

THE ANALYSIS OF WEIGHTED SILK.

The materials most frequently employed for weighting silk are:

1. For colors: tin, phosphoric acid, silica, alumina, lead, antimony, tannin, glue, tungsten, sugar, oil, etc.

2. For the blacks: tin, phosphoric acid, silica, oxide of iron, cyanide of iron, lead, antimony and tin.

To determine quickly whether white silk is weighted with tin or alumina the material is dyed with alizarine with an addition of chalk; a sample of the same shade of silk of which the degree of weighting is known is colored in the same way and the two dyed samples then compared after being washed with soap. The silk not weighted with tin is colored a very light rose; the weighted silk is a bright shade more or less intense according to the quantity of tin in the silk. The silk weighted

with alumina is colored a reddish orange, more or less intense according to the quantity of alumina in the silk. A mixture of alumina and tin used for weighting the silk results in a bluish red, varying according to the proportion of the two oxides.

The quantity of the weighting is determined by means of nitrogen, one part of nitrogen by weight corresponding to 5.455 parts of fibroin or pure silk. As material containing nitrogen, such as phosphate of ammonia, glue, Prussian blue, etc., are used for weighting the silk, these materials must first be completely eliminated.

1. Process for determining the quantity of weighting in colored silk. A sample of silk weighing 15 to 30 grains is selected for the analysis and treated for two hours in a boiling solution of soap containing 4 ounces of soap per gallon, in order to remove the grit and as far as possible the coloring materials. The sample is next treated in a boiling solution of carbonate of soda at 1 1/2° B. in order to eliminate the ammoniacal salts. The sample is washed, then dried, and the nitrogen determined as follows:

The sample is treated for 4 to 6 hours in 1 to 1 1/4 ounces of hot concentrated sulphuric acid, to which is added a small quantity of anhydrous sulphate of copper. The process is stopped when the solution becomes green. The heat is then turned off and permanganate of potash added until the solution becomes an intense green. It is then left to cool, the cooling process being hastened by adding water cautiously. The solution is then made alkaline by the addition of caustic soda. By distillation ammonia is released, which is collected in a known quantity of sulphuric acid. After this operation the excess of acid remaining in the solution is determined. The difference indicates the quantity of acid saturated by the ammonia, likewise the quantity of ammonia and nitrogen.

2. Process for determining the weighting of black. A sample of dry silk weighing 15 grains is taken for the test. It is treated in a 1 per cent. solution of hydrochloric acid heated to 140° F. The solution turns a more or less intense red. The sample is removed and the treatment repeated until the solution turns only a faint rose color. The sample is then washed and left to steep in a solution of Prussian blue and iron salts. The sample is then treated one hour and a half in 50 ounces of a boiling solution of soap containing 4 ounces of soap per gallon; then thoroughly washed and dried. The nitrogen is then determined as in the previous test.—Bulletin des Soies et des Soieries.

WOOL OILS AND THEIR ACTION ON DYEING.

BY LOUIS J. MATOS, Chemical Engineer.

This question is one that has not received the attention its importance deserves, although much has been said and written about it. Viewed from the standpoint of the dyer, the oil question is of little importance provided the intermediate scouring processes have been so carefully carried out as to deliver to him wool, yarn, or cloth of such a degree of cleanliness as not to interfere with his operations. If for some reason this be not possible, and at various times batches of stock go into the dyehouse apparently clean, and subsequently show the results of improper oiling or defective scouring, then it becomes a matter of some concern to the dyer.

There have been many instances where dyestuffs were improperly condemned upon the ground of "dyeing uneven," or "not going on regular," etc., when as a matter of fact the sole trouble was with the extreme difficulty experienced in removing the oil originally used on the wool. A particular case of this kind has only recently passed under the writer's observation. The dyestuff was a well-known type of logwood extract, requiring the usual chrome mordanting beforehand; a small quantity of so-called "fustic crystals" being added to the dye bath to jet the shade. The material to be dyed was yarn, and apparently all the preliminary operations were thoroughly done, but nevertheless the hanks seemed to dye unevenly. While the extremes of shade were in some only slight, yet in others they were quite marked. The entire operation was followed from the dryers to the pickers, then through

the yarn department, and finally into the scouring boxes, which were located in a corner of the dye house. Nothing appeared wrong at the start, but it seemed that the amount of rinse water was not as much as it should be in view of the strength of the scour liquors.

The hanks were looped together by tying with heavy, though loose cords, and it was noticed that there was a certain "pull" on the chain as it passed into the boxes, so that it seemed that here was the whole source of trouble. The tension of the cord prevented proper circulation of the scouring liquors through the ends of the skeins, so that even during the rinsing neither the oil in that part of the skein nor the retained soap liquor was effectively removed. The consequence was that as soon as the skein was put into the chrome bath, an insoluble or perhaps more correctly, a slowly soluble fatty chrome compound was at once formed which was permanently fixed upon the fibres, and which was devoid of any mordanting properties. The consequence was that when the apparently properly mordanted wool was put into the logwood bath, dyeing proceeded regularly except at the portion of the skein where this fatty chrome compound was deposited, showing a lighter and bluer tone. To prove this and not the logwood to be the cause of the difficulty, as originally claimed, an identical skein was taken from the spinning room, scoured by hand, mordanted and dyed with the regular batch, with the result that it was absolutely even in shade and with no defects of any kind.

This test led at once to a change in the methods at this plant. First a wool oil was used that was easily saponifiable or at least readily emulsified at 125° F. with a good soap, and easily washed out with reasonable rinsing. It was discovered that it was a mistake to use a strong soap solution with a view of shortening the time of scouring.

A wool oil should be selected with two objects in view: one to afford proper lubrication to the wool, and the other to facilitate the scouring process by not offering too great a resistance to the soap liquors. A wool oil, contrary to the usually expressed opinions, may contain a certain amount of mineral oil, provided it is compounded with a vegetable oil that emulsifies quickly with soap at a temperature of 125° F. If a strong soap liquor is required, that is, one having a stiff lather, or a temperature in excess of 125°, then difficulty in scouring out will be experienced, not to mention possible injury to the wool.

A good wool oil should be limpid, and not give any indication of being greasy. An oil that works well under a great variety of circumstances is a mixture of equal parts of 28° paraffine oil and olive oil. Such an oil seems to meet nearly all requirements, but its great advantage is that it offers no difficulty in scouring.

To scour yarn properly, where a mineral oil mixture is used, for every 100 lbs. of yarn about to be scoured there should be drawn from the scour box a certain volume of spent scour; then fill up with water at 125° F., or heat to that temperature, and add one pail of stock soap solution. If this routine is continued, there need be no difference in the results with different lots of yarn.

Rinsing should also be done in a systematic manner, and where a warm first rinse water is used there will be found the best result.

The soap used for scouring is of second importance to the choice of an oil. It will not be denied that a straight tallow-soda soap is well adapted for textile work. It is positively detergent in its action, while not dissolving dirt. No soap dissolves dirt: it loosens it, and aids in its subsequent removal during the rinsing. As an emulsifier for mineral oil mixtures, it is the equal of any other type of soap, and for this latter reason should be given careful consideration.

When properly rinsed out, that is, when a sufficient quantity of water is used, it leaves no odor. A mistake is made in any woolen mill to employ a soap compounded with rosin. Such soaps are always less costly to make, and while a saving is effected, it is offset by the increase in the quantity necessary to secure a given result. Not only that, but rosin soaps, even such as may contain only ten per cent. of rosin, usually leave an odor on the wool that is quite difficult to remove.

Chemically, a true soap can be made only from a fatty acid and an alkali, and while a definite compound may be made with rosin and an alkali, it is in no sense a soap, and from a technical point does not possess any of the qualities of soap, it being essentially a filler.

Wool is a very peculiar fibre, and while it is capable of resisting very severe handling, it should receive some consideration. It should never be scoured in the raw state at too high a temperature, as its felting qualities are then to some extent impaired; 120° to 125° F. should be the maximum. Nor should it be scoured with any free caustic alkali in the bath, for this will make the fibres harsh, besides injuring the elastic qualities. Crystal carbonate of soda (monohydrate) and sal soda are the best sodas to use, while the ideal wool scouring alkali is, of course, carbonate of potash, but the cost is against it. Hot oil should never be poured on wool; the oil may be warmed even to 150° F., but its use at higher temperatures should not be permitted. Hot oil soaks into the fibres so that it is with very great difficulty that it can be removed.

Ordinary wool yarns, such as find their way into medium classes of goods, and also carpets, when dyed with the usual line of acid colors from a dye bath charged with Glauber's salt and sulphuric acid, are not likely to show serious defects of scouring, unless the shades are light, but in the case of mordant colors, especially where chrome is used and the dyes are of the alizarine group, such defects are easily apparent.

An easily emulsified wool oil is demanded for stock to be printed. Penetration of color is not as easily secured upon yarns or piece goods that are printed, unless the last trace of wool oil is removed, and no trace of the scouring soap remains.

The wool clip of Western Australia for 1904 is estimated at 12,292,887 pounds.

The leading exports from Australia are, according to their value, wool, gold, wheat, butter, copper; the leading imports are clothing, cottons, metal work, woolens, machinery.

STAINS IN BLEACHED GOODS.

BY HENRY DOUGLASS.

Stains in bleached cotton fabrics include iron rust, kier, lime, wood and oil stains.

Kier stains are caused by the improper packing or plaiting down of the cloth in the kier, leaving holes or loose places in the cloth through which the liquor flows, and leaving the hard or well tramped places somewhat dry and consequently stained. They are also caused by improper circulation of the liquor, which in turn results from the steam getting below the pressure required to force the liquor through the pipe, and in some instances by the kiers not being properly piped. Another cause of kier stains is not having sufficient water to cool the kier quickly after the boiling is done and the hot liquor is drawn off. This exposes the cloth around the sides or bottom of the kier to the hot iron, thereby drying the dirty liquor into the cloth.

Lime stains may be caused by improper slacking of the lime, letting it go into the machine in lumps and getting on the cloth in thick patches. These stains may also be caused by poor circulation and bad plaiting down, as with kier stains, also by insufficient washing and souring after the boil.

Wood stains are caused by piling the bleached goods on wooden racks or platforms or in wood bins that have become black and decayed through long usage.

Iron stains are caused by the goods coming in contact with the sides of the kiers that have become rusty; also by running water on the goods that has become rusty by standing in the pipes; by contact with the heads of nails in the wooden bins or racks; and from drops of water falling from the bolt heads, hangers and other iron work overhead.

Oil stains are caused by the oil working out from the bearings of the shafting and reels and getting on the pulleys and belts and then spattering on the goods.

To prevent or remedy kier stains the bleacher should insist on having the cloth plaited in the kier in even layers and also tramped down firmly. He should be sure the pipe connections are properly arranged

to ensure a continuous circulation of the liquor after the kier is once set to boiling. He should see that there is an ample supply of water for cooling the kier quickly after the boiling is finished. It is a good plan to have a water connection at the bottom of the kier as well as at the top. In cooling off use the top and bottom supply alternately, flushing the goods thoroughly. There should be no leaking of the let-off valve, which might cause a shortage of the liquor during the boiling. If the kiers are boiled at night and there is no night kierman to look after the work, other than the fireman or watchman, then the bleacher should insist on having a steam recording gauge so he can see what the pressure has been through the night. If these suggestions are carried out he should have very little trouble with kier stains. Light stains can in almost every case be removed by rechemicing and souring. Where the stains are so heavy that this will not remove them an extra boil in weak soda ash may do it.

To avoid lime stains see that the lime is properly slacked. A good plan is to slack the lime in an iron or wooden tank a few hours before it is needed. Place some of the slacked lime in the agitator that supplies the liming machine, keeping it agitated all the time it is running into the machine. In running the lime from the agitator to the machine it should pass through a fine wire sieve. The cloth should be plaited down evenly and the suggestions already given for boiling, cooling off, etc., should be followed. After boiling, the cloth should be thoroughly rinsed in a washer supplied with plenty of water. A second wash is very beneficial when one has the necessary time and facilities. From the washer the cloth passes to the souring machine. If the machine is what is called a sour squeezer, care must be taken that there is plenty of liquor in the tank and plenty of slack cloth so that the cloth will be well saturated with sour before passing through the squeeze rolls. The liquor should be kept at the required strength and the sour tank kept clean. It should be emptied and washed out at least once or twice each week. If these suggestions are carried out the bleacher will have no trouble with lime stains.

To prevent iron stains whitewash the ash kiers at least once in two weeks. Draw off the water that has lain in the pipes over night before allowing any to run into the kiers, mixing tanks or washing machines; have all the projecting nails removed from the racks or bins and replaced with wooden pins. All bolt heads, hangers, pulleys, or any other iron work overhead should be painted at least once a year with a good lead paint. By following these directions iron stains should be few and far between. Should they occur they can be removed by applying strong muriatic acid to the spot, followed by a good wash.

To avoid wood stains have the old wood bins or racks removed and replaced by brick bins coated with cement. Porcelain bins are better still. If it is not possible to get these and wood stains appear they can be made very pale, if not removed entirely, by a good buck souring.

To avoid oil stains some careful hand in each department should be appointed to oil the shafting overhead. The hangers, pulleys and belts should be kept clean and a pure vegetable oil should be used in oiling the machinery and shafting. Then if any oil gets on the goods it can be removed by the final boil; if any traces remain they can be rubbed out with warm water and soap. On the other hand if a mineral oil is used and gets on the cloth no amount of reboiling or rubbing will remove it.

A few years ago an article appeared in one of the textile papers saying that a German chemist had at last solved the problem of removing mineral oil stains from cotton goods during the process of bleaching by putting a certain quantity of aniline oil in the boiling kier. Soon after that the present writer had charge of a large bleach house and the firm started up a new weave shed on a high grade of fancy goods. As is often the case in starting up a new plant of this kind the goods were spattered with mineral oil through using an excess of oil in keeping the new bearings from running hot. The trouble was especially serious because of the

high grade of the goods. There was no doubt of the cause, for we had found the spots in the gray goods before putting them through the process of bleaching. We had a young German chemist at the works who experimented at some length with the aniline oil formula. He took goods in the grey and followed them right through the whole process. He also took goods that had been bleached and put them through the whole process a second time. All was to no purpose. The mineral oil showed up just as bright a yellow as before, and I do not hesitate to say that if the fabric had held together to allow its passage through the bleaching process a dozen times over the oil spots would still have been there. The trouble was finally overcome by substituting a pure vegetable oil for the mineral oil.

Where vegetable oil is used on shafting or machinery, turns black and gets on the goods, it will sometimes resist the bleaching process, but the little that is left can in nearly all cases be removed by hot water and soap and a little rubbing. This process can be used with high priced goods providing the bleacher is getting a fair price for doing the work. When the price is low the bleacher cannot afford to run a hand laundry. For these reasons it would seem to be to the interest of all manufacturers making goods to be bleached to use vegetable instead of mineral oil and so prevent as far as possible, the goods from getting spattered with it during the process of manufacture.

When grey goods get spattered with clean oil the spots are not readily detected. Frequently the goods are sold to some converter who has them bleached and finished. When during the process the goods are opened out to be starched and finished, the oil stains are plainly visible. The bleacher will then notify the shipper of the goods, who in turn notifies the manufacturer from whom he bought the goods. Then the trouble begins. The manufacturer will probably say the goods were all right when shipped and that instead of oil stains the spots must be bleachery stains.

Some time ago I had charge of a bleachery and we had a large invoice of goods sent us. We put part of the lot in process soon after they arrived. Before the second part of the lot was put in process the first part was passing through the finishing machinery, and we discovered a large number of oil stains in the lot. We notified the sender of the goods and he answered that the manufacturer from whom he bought the goods claimed the goods had no oil stains on them when they were shipped. The remainder of the grey goods were inspected by drawing them over a perch in front of a window and we found five per cent. of goods had oil stains on them. We sent a swatch to the parties to show them that the fault was at the mill and not at the bleachery. This is not to be taken as meaning that the bleachery is always right and the mill wrong. As an illustration I will give another incident.

Several years ago a prominent manufacturing concern that had a bleachery of its own put in some new iron kiers to take the place of some old wooden centre vomit pipe kiers. This firm had always turned out the very best kind of work. The man in charge had been there many years, but he had never used iron kiers of any make. He had trouble with the new kiers at once. Coming over the dry cans the goods showed large yellow blotches. He was unable to locate or overcome the difficulty and consequently lost his position. The new man who took charge was in the same fix, for he had the same trouble and claimed it was mill oil, but the agent of the mill would not have it so. I was asked to go there and remedy the trouble if possible. I examined some of the stained goods and found that the stains seemed to be caused by bad circulation. I immediately examined the kiers and found, as I expected, that the kiers were improperly piped and as a consequence the liquor did not circulate right. I had them repiped and then put through two lots of goods during the week I stayed with them. Both lots came through without a stain and I know this bleachery has had no trouble of the kind since.

When troubles with spots arises the bleacher should see that everything is in working order in his department. If the stains resemble yellow oil stains, take a swatch and reboil it. If the stains disappear then find out what is causing the trouble; if the stain is there after a second passage through the process the chances are that it is mineral oil and is there to stay.

WEIGHTED SILK FAST TO LIGHT.

Notwithstanding the numerous industrial advantages of the use of the tin silicate phosphate method of weighting silks, it has also great inconveniences.

Reddish spots are spontaneously formed when the treated material comes in contact either with perspiration, or liquids containing sodium chloride, and the influence of the light or even of storage on silks thus weighted results in the loss of the characteristic feel of the silk.

These modifications are due to both physical and chemical changes in the silk and the substances constituting the weighting. The mineral acids possibly exert a hydrolyzing action, with the transformation of the mineral substances from a colloidal state to one of modified crystallization.

It is also possible that electro- or photochemical phenomena may result in oxidation or even in the formation of chlorine and its derivatives.

The spontaneous formation of the reddish spots named is evidently due to phenomena of a chemical nature. Their appearance certainly results not only in the destruction of the coloring matter but also of the silk. On the other hand, the alterations brought about during the time of storage or exposure to light may be due entirely to physical causes, the weighting compounds changing from the colloidal to the crystalline form. For instance, by discharging the weighting substances with hydrofluoric acid the initial strength of the silk is in a great measure restored.

Considerations of this nature led to many attempts so to protect the weighted silk that it would offer resistance to both chemical and physical influences. With this object, tannins, proteids, hygroscopic bodies, and compounds capable of preventing oxidation were tried. Of the latter class, sulphocyanides gave particularly good results.

By associating the ammonium salt with boracic acid, glycerine and tannin, a degree of success was attained such as to preserve a silk fabric weighted to 100 per cent. without the slightest alteration for several months, while a similar sample, not after-treated in the manner indicated, exposed under the same conditions showed signs of deterioration after the lapse of only a few days.

The industrial importance of this process is such that it has been in constant use in a large silk dye works since November.—O'Meister, in the Bulletin de la Societe de Mulhause.

BLEACHING FINE COUNTS OF COTTON WITH SODIUM PEROXIDE.

When it is necessary to bleach to a clear white very fine counts of cotton for lace, etc., peroxide of sodium is greatly to be preferred to bleaching powder. The bleaching can be done in a vat of white wood, stoneware, or enameled metal. No metal except lead can be allowed to come into contact with the bleaching liquid. Hence the heating coil for warming the liquid by indirect steam must be of lead.

If the peroxide bath is not to be used at once, it must be made slightly acid to litmus paper with dilute sulphuric acid; but for use, it must be feebly alkaline, as shown by litmus with ammonia. The bleaching temperature is from 120° to 130° F. The time required varies from three to ten hours, or even more, for brown Egyptian yarn. The material must be well scoured and then rinsed before bleaching. It must lie quite loose in the liquid, so that the latter has free access to every part of it. A good plan for easily bleached yarns, and one which permits of several lots being treated quickly, one after another in the same bath, is to lift each lot as soon as it is thoroughly soaked. It is then lightly wrung back into the bath, till it retains only about its own weight of liquid, and then laid in a warm place for some hours, turning it over occasionally.

The strength of the bath varies with the degree of resistance offered by the cotton to the action of peroxide. An average bath may be represented by the following recipe:

8 lbs. Sodium Peroxide.
10 lbs. Concentrated Sulphuric Acid.
¼ lb. Phosphate of Soda.
100 gals. Water.

The bath is kept standing, and reinforced, as may be necessary, with about 10 gals. of water, 3 lbs. of sulphuric acid and 2 lbs. of sodium peroxide, at a time.—Leipziger Faerber Zeitung.

DECISION AGAINST THE THOMAS & PREVOST MERCERIZING PATENTS.

On Aug. 7 Judge Lowell, of the United States Circuit Court, Boston, handed down a decision, dismissing the suit brought by the American Mercerizing Co. against the Hampton Co., the latter representing a large number of mills that had used the process of mercerizing without paying royalty to the plaintiff. The decision is in part as follows:

MERCER'S PATENT.

"The defendants denied the validity of the patents and their infringement. In order to explain the controversy, the history of the mercerizing process and its discovery must be given at some length. In 1850, John Mercer took out a patent in England, No. 13,296 of that year, for improvements in the preparation of cotton and other fabrics and fibrous materials. Therein his invention was stated to consist in subjecting vegetable fabrics and fibrous materials, cotton, flax, etc., either in the raw or manufactured state, to the action of caustic soda or caustic potash, dilute sulphuric acid, or chloride of zinc. This treatment caused cloth and fibre to shrink, to become thicker, closer and heavier, and especially to acquire greatly augmented and improved powers of receiving colors in printing and dyeing. The process had little or no commercial value, because the treatment caused a shrinkage of the fibre which left the product practically unfit for use. Rec. p. 484.

THE LOWE PATENT.

"In 1889 and 1890, Lowe took out two patents in England, No. 20,314 of 1889, and No. 4,452 of 1890. The latter is relied upon by the defendants as an anticipation of the patents in suit. It concerned improvements in the treatment of materials composed of cellulosic fibres (such as cotton and flax), through which treatment a better appearance or finish and increased strength and a greater power of assimilating coloring matters and dyes is induced. Lowe's process consisted in treating cloth or yarn with caustic soda, shrinkage being prevented by stretching during or immediately after the treatment. Lowe's process thus differed from Mercer's in two respects: First, in a limitation of the mercerizing process to a treatment of cotton or flax with caustic soda, instead of extending it to a treatment of any vegetable fibre with either alkali or acid, and second, in stretching the cloth or yarn before drying it. The material so treated will possess all the advantages of being considerably stronger; having a greater capacity of absorbing natural moisture; having a more regular, close and glossy appearance; and of taking up many dyes and coloring matters more readily and economically, while at the same time the objection of having been shrunk is obviated. There is no evidence that Lowe's process, under his name, ever went into commercial use.

THOMAS AND PREVOST'S PATENTS.

"On March 23, 1895, Thomas & Prevost, the patentees of the patents in suit, filed an application in Germany, of which country they were citizens, for a patent concerning a process for the dyeing of cloths woven from raw material out of mixed (animal and vegetable) fibres, to attain color effects which hitherto were not attainable by dyeing the raw goods in the piece. The vegetable fibre (for example, cotton) is, as is well known, chemically altered by the treatment with strong alkalies or acids. At the same time, the cotton acquires a very great affinity for all dyestuffs and mordants. In order to avoid the shrinking or narrowing of the goods, the cotton, either before the weaving or spinning, is treated with the above-named substance; or the already made raw goods, stretched by the use of a special mechanical contrivance into a condition of full width, is passed through the fluid preparation mentioned, and is washed in the same state. Apparently Thomas & Prevost then intended to stretch only the woven fabric, leaving the mercerized yarn to be woven after shrinking. Their amended specifications of June 20, however, contemplated stretching either yarn or cloth. The claim was as follows:

" 'Process of enhancing the affinity of vegetable fibre to be dyed, for dye-stuffs and mordants by preliminary treatment with strong bases or acids, characterized by this: that the vegetable fibre in the form of skein, or already woven, or finally loose before the spinning, is exposed in a tensely stretched condition to the action of bases or acids, and during retention of this condition is washed out, until the internal fibre-tension has relaxed, for the purpose of avoiding the shrinking of the fibre.'

LITIGATION IN GERMANY.

"A proceeding to annul this patent, No. 85,564, was brought in the German Patent Office, based chiefly upon the English patent to Lowe. The patentees resisted the annulment, and argued that the patent, notwithstanding the breadth of its claim, was limited in effect to the dyeing of mixed fabrics in the piece, and that this was the gist of their invention. In other words, they sought to save the patent by narrowing the claim by reference to the specifications. Rec. pp. 17, 19, 24, 20, 29. Nothing was said about the silky lustre given by mercerization under tension. The court held that the claim was broader than the invention described in the argument of the patentees, and it annulled the patent on the ground that the invention described in the patent had been anticipated by Lowe. The course of the litigation exhibited an attempt by the patentees to narrow their invention and the patent which protected it to the mercerization of a mixed woven fabric, a process not used by the defendants. On the other hand, if the German patent were construed in its broader sense, and were treated as analogous to No. 600,826, here in suit, the patentees did not seriously dispute anticipation by Lowe. The controversy was between the German patent and that of Lowe. The decision of this controversy depended upon a determination whether the German patent was similar to No. 600,826, in which case anticipation by Lowe was practically admitted, or was limited to the mercerization under tension of mixed fabrics in the piece, in which case it might stand. The German court gave the patent the first-mentioned construction. Rec. pp. 26, 49.

DISCOVERY OF THE LUSTROUS EFFECT.

"On September 3, 1895, Thomas & Prevost filed in Germany an application for another patent stated to be for an improvement in the process of mercerizing. It differed from the earlier application chiefly as to the time when tension should be applied. The second patent specified that mercerization should take place without initial tension, but that tention should be applied before the acid or alkali had been washed out. On April 4, 1896, in the course of litigation, the silky luster given by mercerization under tension was first mentioned, and at the same time was considerably emphasized. Letters written to the patentees by their customers indicate plainly that mercerization under tension, suggested by the patentees in order to dye better the cotton constituents of a mixed fabric, was found to be valuable chiefly because of the silky luster which it imparted to the cotton. This result was not at first known to Thomas & Prevost and was first discovered, some months after their first application, either by them or by some other person using their process. Rec. pp. 73, 229, 504. The first specific mention of it is in a letter dated February 11, 1896, Rec. p. 81, though a vague suggestion of it appears in a letter to the patentees, written in June, 1895. Lowe had noted the result five years earlier, when he mentioned the glossy appearance of the cotton treated by his process, though want of considerable experiment had prevented him from appreciating fully the importance of his discovery. The patentees did not distinguish between a stretching of the fibre to a length greater than it had before mercerization and restoring the fibre to that length. As between stretching the fibre or merely bringing it back to its original length, the patentees' language was vague, e. g. Rec. pp. 2, 58, 60, 72, 79, 170.

LOWE'S PATENT UPHELD IN GERMANY.

"The German Patent Office refused to issue the patent as originally applied for, but after much argument, on July 30, 1898, allowed a claim as follows, No. 97,664:

"'A modification of the process described in the patent No. 85,564, as well as in the English patent No. 4,452 of the year 1890, for the mercerization of cotton under tension characterized in this wise—that the cotton saturated with soda-lye is subjected to a considerably stronger distending force than has been obtained by normal application of machines hitherto customarily used for like purpose in skein and piece dye-works, so that even long-fibered and hard-spun cotton can be stretched out to its original length and beyond, and the fibre by the mercerization under tension acquires a lasting silk-like luster in consequence of alteration of its structure. Rec. p. 204.'

"The gist of the invention patented was thus declared to be the use of machinery of extraordinary stretching power in the mercerization of long-fibered and hard-spun cotton. Rec. p. 233. Lowe was recognized as a pioneer. Indeed, the subsequent annulment of No. 85,564, because anticipated by Lowe, left Lowe the only pioneer. Proceedings to annul No. 97,664 were soon begun. The lower court held that the invention described in the original application was anticipated by Lowe; that the extraordinary distending force was not introduced into the application until 1897; and that before 1897 the process of stretching had become old in the art.

THOMAS AND PREVOST CLAIM PROTECTION AS GERMANS.

The Court of Appeals affirmed this decision, impervious to the argument that the Thomas & Prevost invention is a German one and deserves national protection. Rec. p. 181. It assumed that the original application had been anticipated by Lowe, and that the patent as granted was limited to the use of extraordinarily strong machinery to stretch long-fibered cotton. The patent was annuled upon the ground that, as granted, it did not correspond to the original application upon which it was necessarily based. The German courts thus held consistently that Thomas & Prevost had invented nothing, except perhaps the application of machinery of extraordinary strength to the stretching of long-fibered cotton. As nothing concerning the nature of this machinery was disclosed, the decisions left nothing patentable to Thomas & Prevost.

"On September 26, 1895, Thomas & Prevost applied for a patent in England. The application concerned the matter of both the German applications. It contained no reference to gloss or luster. The claims were as follows:

1. The herein-described improvement in treating vegetable fibres for dyeing purposes with alkaline lyes or with acids consisting in subjecting the vegetable fiber (in the hank or as a woven fabric) for the purpose of preventing shrinking of the fibre whilst firmly stretched to the action of the bases or acids and then washing the fibre while still stretched until the internal stress or tension thereof has ceased substantially as and for the purposes set forth.

2. The herein-described improvement in treating vegetable fibres for dyeing purposes with alkaline lyes or with acids consisting in subjecting without stretching the vegetable fibre (in the hank or as a woven fabric) to the action of bases or acids and then—whilst it is still wet with the lye and shrunken—stretching same to its original length and breadth and thereafter washing same while stretched as before substantially as and for the purposes set forth.

BARGAIN BETWEEN THOMAS AND PREVOST AND LOWE.

"The application was opposed by Lowe, and a patent was refused accordingly. Later Lowe agreed with Thomas & Prevost to withdraw his opposition. Following the English statute, an application was made to the Solicitor General for leave to file new evidence and to reopen the case, so as to permit the patent to be issued either after amendment or by way of reversing the action of the English Patent Office. The Solicitor General refused the application, holding that after Lowe's objection had once been entertained the public had an interest in the contest, which could not be satisfied by an agreement between the contestants. A later application by Thomas & Prevost, September 18, 1896, resulted in a patent, No. 20,714 of 1896, after Lowe had withdrawn his opposition thereto. A patent based upon a bargain with the

real inventor and an earlier patentee has no weight as an argument in this case. It follows that the English Patent Office held unequivocally that the invention claimed in the patents in suit was anticipated by Lowe. In Germany, the birthplace of the alleged invention, and in England, the home of the Lowe patent, the latter was held to anticipate everything of real value in the application of Thomas & Prevost.

SILKY LUSTER, FIRST MENTIONED.

"Many patents were granted to Thomas & Prevost in countries of continental Europe. In some of these silky luster was mentioned; in others this characteristic was not noticed. No proof has been made of the patent laws of these countries, and so this court is not informed what weight should be attached to the patents therein granted. The application for No. 600,826 was filed in the American Patent Office June 4, 1896. It did not distinquish between mercerization of cotton and flax, and of all vegetable fibres generally. It made no distinction between mercerization by alkalies and by acids. The patent to Lowe was not noticed in the American Patent Office. No. 600,827 was applied for January 22, 1897. The application sought to patent mercerization without tension at the outset, the tension being applied altogether after the fibre is wetted. It is true that the specifications, especially page 2, lines 32-34, are vaguely expressed in this respect, and the complainant's expert has argued that without tension means no such tension before mercerizing as is contemplated and necessary for the production of a silk-like luster, whatever that degree of tension may be. This contention, however, is altogether at variance with the claims in suit.

CANNOT CLAIM WHAT THEY DID NOT DISCOVER

"In No. 600,827, Thomas & Prevost further sought to state invention as follows: While it is common to treat fibrous materials with certain mmercerizing fluids and other mordants while such material is held in a more or less stretched condition, we are not aware that any one prior to our invention has discovered the important fact herein disclosed—namely, that the fibrous material when subjected to a sufficient stretching action during the mercerizing process will be given a peculiar silk-luster. But if the process is unchanged, the discovery of a new result does not constitute invention. If reliance be placed upon some specific degree of stretching, not practised before, we find that the patent states that it is sufficiently definite for a proper understanding by those skilled in the art to say that the material must be so stretched during the mercerizing process that the individual fibres will be elongated and the silk-like luster will be produced. The patentee thus says in effect: I seek a patent for mercerizing under tension to produce a silky luster. I am aware that mercerizing under tension has been common, but no one has hitherto noticed that a silky luster results. I cannot say how much tension is neccessary to produce this luster; it is enough to say that the tention must be sufficient. This is not to state an invention and, moreover, as has been seen, Lowe's patent states both tension and resulting gloss. Thomas & Prevost never showed, and, so far as appears, never knew, whether mercerization under tension, or tension after mercerization, whether tension to maintain the fibre at its original length, or tension to increase this length, best imparted the silky luster sought. The evidence shows that it may be produced in all these ways. Having proposed to mercerize mixed fabrics under tension for the sake of an improvement in dyeing, they discovered by themselves, or were informed by some manufacturer who used their process for its original purpose, of the wonderful and unexpected luster. They did not first invent the process, for Lowe described it clearly.

LOWE THE FIRST TO DISCOVER THE LUSTROUS EFFECT.

There is no proof that they were the first to notice the luster, because (1) the time, place and manner of its first observation in Germany is not shown, and (2) it had been observed five or six years earlier in England by Lowe. They did not invent any detail of the process, which made the result better or more certain than did the process described by Lowe, for their patents in substance disclose nothing as to the time of tension, except that it must be before the yarn is dried, and nothing as to the degree of tension, except that it must be enough and not too much. They do not distinguish between vegetable fibre that will take on an attractive luster, and the fibre that will not, or between alkalies which are effective for the purpose, and the acids which are practically useless. Their language does not go beyond Lowe's statement that fibres such as cotton and flax mechanically stretched whilst subjected to the action of or treatment by the sodium hydrate or subjected to a stretching process or operation after the sodium hydrate bath, but necessarily before the fabric has lost its temporarily pliable condition have a more regular, close and glossy appearance. Of the two Lowe is the more specific.

THE DECISION.

"Summarizing the history, we find that Mercer first suggested the process which has since gone by his name; but he did not distinguish between different kinds of vegetable fibre, nor between the application of acids and alkalies. As the shrinkage was uncontrolled, no practical result followed from his invention, and the silky luster, which is by far the most important result of mercerization, was not suspected by anyone. Forty years later Lowe first discovered and suggested mercerization under tension. He further improved upon Mercer by differentiating the various kinds of vegetable fibre, and limiting the process of mercerization to cellulosic fibres (such as cotton and flax). He also limited his mercerizing agent to caustic soda, and thus pointed out the practical limitations of the art. He discovered that the process would give to the cotton mercerized a glossy appearance; but he did not fully recognize the importance of this result. His invention did not go into practical use, probably by accident, and so the emphasis which experiment would have put upon the luster did not arise from his discovery. Thomas & Prevost, perhaps independently, discovered mercerization under tension. At first they knew nothing of the luster thus imparted, that is to say, they of-

fered no suggestion beyond Lowe's as to the method, and they knew less than did Lowe of the result. But their process came into use, and by their experiment, or by that of others, the silky luster was found to be all important. Thomas & Prevost then tried to save themselves from the anticipation of Lowe by suggesting unimportant differences. These attempts have failed wherever there has been a contest. They bought out Lowe, but the success they secured in Great Britain and elsewhere is unavailing in the United States where Lowe's invention belongs to the public. It follows that the claims in suit are anticipated by the British patent to Lowe, and the bill must be dismissed with costs."

It was stated at the trial that this was a test case and would doubtless be carried up to the court of last resort on appeal.

Color Cards.

Chrome Fast Black F; Berlin Aniline Works, 213 Water St., New York City.

A folder showing different percentages of Chrome Fast Black F on wool from the raw state to the finished goods. Full directions are given for dyeing and for dyeing and chroming under varying conditions.

Chlorazol Brilliant Blue R; Read Holliday & Sons, 7 Platt St., New York City.

A card showing seventeen samples of raw cotton, cotton yarn and cotton piece goods dyed with varying percentages of Chlorazol Brilliant Blue R for which full working directions are given.

Brilliant Sky Blue; Continental Color and Chemical Co., New York City.

Two samples of cotton piece goods showing 1 1/2 per cent. dyeings of Brilliant Sky Blue G and 5G. These colors are specially well adapted for mercerized crimp styles.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 145.

Blue on Worsted Yarn.

Acid Blue 6 B on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Acid Blue 6 B.
(American Dyewood Co., 154 William St., New York City.)
4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter at 160° F. and dye at a boil for one hour.

Acid Blue 6 B is a very level dyeing color, is adapted for the production of compound shades and is a self color.

Recipe No. 146.

Orange on Worsted Yarn.

Meta Chrome Orange R Double on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Meta Chrome Orange R Double.
(Berlin Aniline Works, 213 Water St., New York City.)
3 lbs. Meta Chrome Mordant,

dissolving the mordant first and adding the dyestuff afterward.

Enter yarn at 140° F., raise to a boil and dye at a boil for one to one and one-half hours, or until the bath appears exhausted, and then continue the boiling for one-half hour longer in order to fix the dyestuff completely.

Meta Chrome Orange R Double possesses the good qualities characteristic of most of the mordant acid colors.

Recipe No. 147.

Black on Worsted Yarn.

Naphthylamine Black 4 B N on 100 lbs. worsted yarn. Prepare the dye bath with

6½ lbs. Naphthylamine Black 4 B N.
(Continental Color & Chemical Co., 128 Duane St., New York City.)
15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter yarn at 120° to 160° F. and add the sulphuric acid in several portions and dye at a boil until the dye bath is exhausted.

Naphthylamine Black 4 B N possesses very good fastness to the common color destroying agencies and dyes very level.

Recipe No. 148.

Pink on Bleached Cotton Yarn.

Brilliant Direct Red B on 100 lbs. bleached cotton yarn. Prepare the dye bath with

¼ lb. Brilliant Direct Red B.
(E. M. Thayer & Co., 411 Atlantic Ave., Boston, Mass.)
10 lbs. Common Salt.

Enter at 170° F. and dye at a boil for one hour.

Brilliant Direct Red B will be found particularly useful for the production of pinks and in combination with other dyestuffs as it dyes very evenly. It possesses good fastness to light and acids.

Recipe No. 149.

Bordeaux Red on Cotton Yarn.

Bordeaux Thiogene Dark Red R on 100 lbs. cotton yarn. Prepare the first dye bath with

10 lbs. Thiogene Dark Red R.
(H. A. Metz & Co., 122 Hudson St., New York City.)
10 lbs. Sodium Sulphide (Crys.).
5 lbs. Sodium Carbonate.
30 lbs. Common Salt.

Second Bath.

6½ lbs. Thiogene Dark Red R.
(H. A. Metz & Co., 122 Hudson St., New York City.)
6½ lbs. Sodium Sulphide (Crys.).
1 lb. Sodium Carbonate.
5 lbs. Common Salt.

Dissolve the dyestuff with the necessary amount of sodium sulphide and then add the soda ash and common salt.

Dye for one hour at a temperature just below the boil, keeping the yarn below the surface of the liquor as much as possible.

Thiogene Dark Red R is an approach to a sulphur red. It possesses good fastness and will be found valuable in the production of compound shades with other sulphur colors.

Recipe No. 150.

Black on Cotton Yarn.

Thioxine Black 3 B O on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Thioxine Black 3 B O.
(Geisenheimer & Co., 189 Front St., New York City.)
30 lbs. Sodium Sulphide Crystals.
8 lbs. Soda Ash.
50 lbs. Common Salt.

Dissolve the dyestuff in boiling water, together with the sodium sulphide, then add soda ash, boil the bath and skim the surface, if necessary, then add the common salt.

Dye at a temperature just below a boil for one hour, keeping the material below the surface of the liquor as much as possible.

Thioxine Black 3 B O is a very level dyeing color and does not produce bronzing. It possesses remarkable fastness to soap and milling, to acids, alkalies and light.

Recipe No. 151.

Blue on Cotton Yarn.

Chlorazol Blue 7 C B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Chlorazol Blue 7 C B.
(Read Holliday & Sons, Ltd., 7 Platt St., New York.)
5 lbs. Common Salt, Glauber's Salt or Sodium Sulphate.

Coppering should be carried on for 20 minutes at 140° F., with up to

2 lbs. Copper Sulphate,

according to depth of shade required.

Chlorazol Blue 7 C B has very good fastness to light, washing and alkalies, and excellent fastness to acids. The coppered shades are exceedingly fast to light and washing.

Recipe No. 152.

Red on Worsted Yarn.

Biebrich Acid Red 5 B on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Biebrich Acid Red 5 B.
(Kalle & Co., 530 Canal St., New York City.)
4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter at 160° F., and dye at a boil for one hour.

Biebrich Acid Red 5 B is an even dyeing acid color possessing good fastness.

Recipe No. 153.

Heliotrope on Bleached Cotton Yarn.

Direct Heliotrope 8730 on 100 lbs. bleached cotton yarn. Prepare the dye bath with

¼ lb. Direct Heliotrope 8730.
(W. F. Sykes & Co., 85 Water St., New York City.)
10 lbs. Glauber's Salt.

Enter at 180° F. and dye at a boil for one hour.

Direct Heliotrope 8730 is fairly fast to washing and milling and can also be used for dyeing union goods.

Recipe No. 154.

Garnet on Worsted Yarn.

Meta Chrome Bordeaux R on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Meta Chrome Bordeaux R.
(Berlin Aniline Works, 213 Water St., New York City.)
6 lbs. Meta Chrome Mordant,

dissolving the mordant first and adding the dyestuff afterward.

Enter the yarn at 140° F., raise to a boil and dye at a boil for one to one and one-half hours, or until the bath appears exhausted, and then continue the boiling for one-half hour longer in order to fix the dyestuff completely.

Meta Chrome Bordeaux R possesses the good qualities characteristic of most of the mordant acid colors.

Recipe No. 155.

Yellow on Cotton Yarn.

Diamond Phosphine G G on 100 lbs. cotton yarn. First mordant the yarn with tannic acid by allowing it to steep for several hours or over night in a bath containing

4 lbs. Tannic Acid.

Wring, without washing, and work for twenty minutes to one-half hour in a bath containing

2 lbs. Tartar Emetic.

Wash and then dye in a bath made up with

2 lbs. Diamond Phosphine G G.
(Cassella Color Co., 182 Front St., New York City.)
½ lb. Acetic Acid.

Dye at a temperature not exceeding 140° F.

Diamond Phosphine G G is excellently suited for dyeing and printing as well as the topping of diamine or immedial colors. Its fastness to washing is very good.

Recipe No. 156.

Blue Black on Worsted Yarn.

Naphthylamine Black 10 B on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Naphthylamine Black 10 B.
(Continental Color & Chemical Co., 128 Duane St., New York City.)
15 lbs. Glauber's Salt.
2 lbs. Sulphuric Acid.

Enter yarn at 120° to 160° F. and add the sulphuric acid slowly, and dye at a boil for one hour.

Naphthylamine Black 10 B possesses very good fastness to the common color destroying agencies and dyes very level.

Recipe No. 157.

Red on Worsted Yarn.

Biebrich Acid Red 5 B on 100 lbs. worsted yarn. Prepare the dye bath with

2½ lbs. Biebrich Acid Red 5 B.
(Kalle & Co., 530 Canal St., New York City.)
4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter at 160° F., and dye at a boil for one hour.

Biebrich Acid Red 5 B is an even dyeing acid color possessing good fastness.

Recipe No. 158.

Yellow on Cotton Yarn.

Diamond Phosphine P G on 100 lbs. cotton yarn. First mordant the yarn with tannic acid by allowing it to steep for several hours or over night in a bath containing

4 lbs. Tannic Acid.

Wring, without washing, and work for twenty minutes to one-half hour in a bath containing

2 lbs. Tartar Emetic.

Wash and then dye in a bath made up with

2 lbs. Diamond Phosphine P G.
(Cassella Color Co., 182 Front St., New York City.)
½ lb. Acetic Acid.

Dye at a temperature not exceeding 140° F.

Diamond Phosphine P G is excellently suited for dyeing and printing as well as the topping of diamine or immedial colors. Its fastness to washing is very good.

Recipe No. 159.

Black on Cotton Yarn.

Thioxine Black R O on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Thioxine Black R O.
(Geisenheimer & Co., 189 Front St., New York City.)
30 lbs. Sodium Sulphide Crystals.
8 lbs. Soda Ash.
50 lbs. Common Salt.

Dissolve the dyestuff in boiling water, together with the sodium sulphide, then add soda ash, boil the bath and skim the surface, if necessary, then add the common salt.

Dye at a temperature just below a boil for one hour, keeping the material below the surface of the liquor as much as possible.

Thioxine Black R O is a very level dyeing color and does not produce bronzing. It possesses remarkable fastness to soap and milling, to acids, alkalies and light.

Recipe No. 160.

Rose on Cotton Yarn.

Rosanthrene Rose on 100 lbs. cotton yarn. Prepare the dye bath with

8 lbs. Rosanthrene Rose (5 lbs. standing kettle).
(A. Klipstein & Co., 122 Pearl St., New York City.)
25 lbs. Glauber's Salt.
3 lbs. Soda Ash.
5 lbs. Soap.

Enter at 180° F., and dye at a boil for one hour. Then rinse and diazotize in a cold bath for one-half hour, made up with

1½ lbs. Sodium Nitrite.
8 lbs. Hydrochloric Acid.

Rinse again and develop in a bath containing

1 lb. Beta Naphthol.
1 lb. Caustic Soda Solution, 40 Be.

Rosanthrene Rose when diazotized and developed in this way gives an excellent and fast shade of rose.

Mill News.

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires facts and gossip of the trade are referred to the Textile Advance News, issued weekly by the publishers of the Textile World Record, at $15.00 per year.

COTTON.

New Mills.

*Alabama, Talladega. The new plant reported to be started here by M. B. Lewis and M. E. Matthews, is for making white hosiery yarns and not hosiery as was reported.

*Georgia, Comer. Contract has been awarded for erection of the new buildings for the Mallison Braided Cord Co's new plant at this place.

*Georgia, Crawford. The Edwards Mills is name of the new plant to be started here for making yarns and twines, 8 to 16, 2 to 4 ply in skeins and on tubes. Will have an equipment of 5,000 ring spindles. Building is partly up, will run by electric power. Expects to start operations about March '07.

*Georgia, Summerville. The Summerville Cotton Mills have been reported organized with capital stock of $150,000, with John D. Taylor, president and treasurer of the company; E. W. Sturdivant, vice-president and E. N. Martin, secretary. They propose establishing a plant with capacity of 5,000 spindles and about 150 looms, but will only install about 4,000 spindles and 120 looms at start. Propose manufacturing cotton duck. Ernest Montgomery will be superintendent.

Massachusetts, Brockton. The Star Webbing Company is equipping a plant in the building formerly occupied by the Brockton Mallet Co., and will manufacture findings for the shoe trade. Two new looms have already been received.

*Mississippi, Batesville. Construction work has been started on the Batesville Yarn & Cordage Co.'s new plant. The main building will be 150 by 50 feet, with two smaller buildings, 40 by 24 feet and 40 by 36 feet. Plant will have capacity of 1,200 lbs. cotton rope and twine daily. The spindle equipment has not yet been decided upon.

*New York, Le Roy. The Le Roy Cotton Mills expect to have their new plant in operation, with full force, by January 1st. Work on remodeling the building to be utilized is nearly completed and contracts have been awarded for the heating and lighting.

*North Carolina, Belmont. Work is progressing on the new plant for the Imperial Yarn Mills. It is expected to have the buildings ready for installation of the machinery by the end of November.

*North Carolina, Bessemer City. Arrangements are being made for starting construction work on the Crescent Mills, capitalized at $150,000. This mill will have an equipment of 3,000 spindles for making 40s two ply yarns.

*North Carolina, Concord. Contract has been awarded to T. C. Thompson & Bro. (Birmingham, Ala.) for erection of the two new cotton mills and 200 tenement houses for the Cannon Mfg. Co. at new town about 7 miles north of this city. The equipment of both mills will comprise 50,000 spindles and 1,300 looms for making yarns and sheeting. Work on the above plant will be started as soon as the spur track has been put in by the Southern R. R.

*North Carolina, Lowell. The Peerless Manufacturing Co. will start operations in their new plant about January, making yarns on cones, tubes, skeins and warps, 40s to 60s, of carded peeler. This plant will have an equipment of 5,000 ring spindles. John C. Ranken is president of the company and superintendent and L. M. Robinson, treasurer.

*North Carolina, Lumberton. Work is nearly completed on the Dresden Cotton Mill and operations will start at an early date. This plant will be operated on hosiery yarns with an equipment of 10,000 spindles.

*North Carolina, Mooresville. We have been advised by E. W. Brawley that he is interested only in soliciting subscriptions for a 5,000-spindle mill to be built at this place next spring. They contemplate operating the plant by electricity. Enough has already been subscribed of the $100,000 to guarantee the project.

*North Carolina, Mt. Airy. The Mt. Airy Cotton Mill Co., recently reported incorporated with capital stock of $100,000, has purchased a building which will be equipped for making 30s yarns on tubes and cones and in skeins, 2 to 4 ply. They expect to start operations about Nov. 1, with 5,040 ring spindles, using electric power. Lee H. Battle is president of the company; F. H. Chamberlain, treasurer; and W. H. Thomburg, superintendent. Yarns will be sold through Paulson, Linkroum & Co. All contracts have been placed.

*North Carolina, Mt. Holly. The Woodlawn Cotton Mills propose starting operations in their new plant during October.

*North Carolina, Selma. It is expected to have the new buildings under construction for the Lizzie Cotton Mills Co., completed so that machinery may be installed and put in operation in December. This plant will be equipped with 10,500 spindles for making yarns, using steam power.

*South Carolina, Calhoun Falls. The Calhoun Cotton Mills Company has been organized with capital stock of $50,000. Among those interested in the project are Judge W. F. Cox, W. A. Watson, N. B. Sullivan and R. E. Ligon.

Pennsylvania, Philadelphia. A plant for the manufacture of silk and mercerized cotton shoe and corset laces has been started by Harry Z. Taylor at 219 North 4th Street, where he is op-

erating 12 braiders, with electricity as the motive power, selling the production direct. Mr. Taylor states that he has plenty of orders on hand and does not doubt but what he will have to increase the number of his machines after the 1st of the year.

*Rhode Island, Alton. The Alton Manufacturing Co., capitalized at $700,000, contemplates having the new building completed and ready for operations by January 1st, making trimming laces. J. O. Curry is president of the company; C. S. Johnson, treasurer and Chas. W. Shepard, manager. The product will be sold direct.

*South Carolina, Rock Hill. Contract has been let for erection of the new buildings for the Arragon Cotton Mills. This company is capitalized at $350,000 and proposes erecting a plant with equipment of 20,000 spindles and 600 looms for making cotton cloth. At first but 10,000 spindles and 300 looms will be put in.

Enlargements and Improvements.

*Alabama, Anniston. A meeting will be held Nov. 13th by the Anniston Yarn Co. to decide just what the enlargement to the plant will be; propose doubling the present capacity (5,004 spindles). The plant is operated on yarns, 18s to 24s.

Alabama, Piedmont. Work has been started on foundation for an addition to be made to the Coosa Manufacturing Co.'s plant. They will add several hundred new machines.

Connecticut, Moodus. The New York Net & Twine Company is to install additional spinning frames in the plant.

Connecticut, Moodus. Hall, Lincoln & Co., proprietors of the Chace Mill, are adding a number of looms purchased from the Plymouth (Mass.) Mill, which has been discontinued.

Connecticut, New Haven. The New England Warp Co. is having plans prepared for an addition, 45 by 40 feet, one story, for a storehouse.

Connecticut, Unionville. J. Broadbent & Son have recently completed erection of a new power house and installed engine and boiler of larger capacity than the old one. A new water wheel has also been placed.

*Maryland, Baltimore. Work is well under way on the new mill for the W. & J. Knox Net & Twine Co. 10,000 more spindles will be installed and the power plant increased from 200 h. p. to 1,000 h. p.

Maryland, Baltimore. Contracts have been awarded by the Mount-Vernon Woodberry Cotton Duck Co. for a number of additional buildings at the Meadow Mill, Woodberry. A large opener and cloth house, 100 by 75 feet, one story, will be erected, and underneath same will be constructed a large reservoir with capacity of 500,000 gallons water. A pump house, 26 by 22 feet, one story, will also be built.

Massachusetts, Adams. An addition, 120 by 40 feet, will be built to the Renfrew Manufacturing Co.'s plant. It is expected to have the work complete about the middle of October.

Massachusetts, Clinton. The stockholders of the Lancaster Mills have approved of the plans made by the officers of the company and the capital stock has been reduced to $300,000 and then voted increased to $600,000. It is said that the subscriptions to the new $300,000 have been nearly all subscribed.

*Massachusetts, Easthampton. At meeting held recently by the directors of the West Boylston Manufacturing Co. it was voted to proceed with plan of enlargements which have been under consideration. A new mill, 325 by 120 feet, brick, two stories, with extension, 120 by 50 feet, one story, brick, will be built.

Massachusetts, Fitchburg. An addition, 40 by 28 feet, one story, is under construction for the Fitchburg Duck Mills, to make additional space for the cloth room.

Massachusetts, Holyoke. The American Thread Company is to build an extensive addition to plant here. An addition of one story will be made to the main building and a three story addition will be built adjoining one of the ells. Contracts have been duly awarded.

Massachusetts, Lawrence. The Pacific Mills after a long trial of the Bell system, have placed a contract for an installation of Bell humidifiers with the Bell Pure Air & Cooling Co.

*Massachusetts, New Bedford. Work will start about Sept. 25th on erection of a new weave shed for the Wamsutta Mills. They will add 800 new looms.

New York, Newburgh. The Lackey Mfg. Co., manufacturing lace curtains, etc., has been closed for the first week in September in order to make repairs to the machinery.

North Carolina, Burlington. The new finishing mill being erected for the Aurora Cotton Mills will soon be completed and equipped with modern machinery.

North Carolina, China Grove. The Patterson Manufacturing Company is to install ten new spinning frames in the mill. They will also build an addition of 34 feet to the plant.

North Carolina, Cooleemee. The Erwin Cotton Mills have reported as having purchased the Cooleemee Cotton Mills and will operate same as the Erwin Cotton Mills.

*North Carolina, Franklinville. The Randolph Mfg. Co. has started work on an addition to the plant; they will install 1,664 new spindles and 54 looms.

*North Carolina, King's Mountain. The Dilling Cotton Mills, which have let contract for 5,000 more spindles to be installed in the plant, will also put in 2,500 twister spindles.

North Carolina, McAdensville. The McAden Mills contemplate building a new spinning mill of from 8,000 to 10,000 spindles.

North Carolina, Weldon. The Weldon Cotton Mills are soon to instal a gasoline engine in the plant, to be used when the water power is insufficient.

Pennsylvania, Philadelphia. F. J. Clements, 2803-5-7 Fairhill St., has recently put in one Garnett shredder for the purpose of manufacturing wastes of all kinds. Mr. Clements states that within a short time it is his intention to greatly increase the plant, taking over a building in the rear, which will enable him to put in more machinery for this purpose.

Rhode Island, Arcadia. Geo. C. Gordon and Edward M. Tillinghast, under the firm name of Gordon & Tillinghast, are to begin work at the Roger Williams Cotton Mills in Hope Valley, R. I. The mills are to be stocked with new machinery and the product will be cotton yarns of all kinds. They expect to get in operation at an early date.

Rhode Island, Ashton. Contract has been awarded by the Lonsdale Company for building a large addition to the storehouse of their Ashton Mill at Cumberlalnd.

*Rhode Island, Centreville. Contract has been let for erection of the addition to be built by the Warwick Mills. A new one story building, with saw tooth roof, having accommodations for 1,500 looms, will be built.

Rhode Island, North Scituate. The North Scituate Cotton Mills have started work on an addition to the mill.

*Rhode Island, Warren. Work is progressing on the foundation for the Warren Mfg. Co.'s new mill. It is expected to have the building roofed in before the cold weather sets in.

Texas, Sherman. The Sherman Manufacturing Company has been incorporated with capital stock of $150,000 and will continue operating the plant formerly known as the Sherman Cotton Mills. The machinery and equipment will be overhauled and capacity of the plant greatly increased. H. W. Fairbanks, J. T. Howard (Dallas) and W. H. Wellington and H. S. Sears, of Boston, are interested in the new organization.

Mills Starting Up.

*North Carolina, Raeford. Operations have been started in the Raeford Power & Mfg. Co.'s new mill. A new building 325 by 77 feet, with power house 35 by 9 feet has been erected. Plant is equipped with 5,016 spindles for making yarns 8s to 16s.

Pennsylvania, Philadelphia. Andrew J. Michie, who about a year ago disposed of his plant for the manufacture of hair cloth, which was located at 2d and Diamond Streets, has again started up and is equipping a plant in the Bromley Mills, Jasper and York Streets, with 30 looms to be run on the same line of goods. The motive power is electricity. He will sell direct.

WOOLEN.

New Mills.

Montana, Great Falls. The Manchester Woolen Mills, which started operations about the first of July, have not yet got into full operation. Additional capital is desired to run the plant to its full capacity and add some necessary machinery, which they are in the market for. An opportunity is offered to a good man to join the company and put in capital and act as superintendent.

*New Hampshire, Franklin. Benj. F. Hayes expects to start operations about Oct. 1, in the new plant which he is establishing, for making satinets, woolens, worsteds, fancy and plain. Will operate 2 sets cards and 14 looms.

Pennsylvania, Philadelphia. C. P. McConbille and John Hasley, Jr., are equipping the first floor of the O'Neill Mill, Oxford & Josephine Sts., Frankford, with 24 narrow looms to be run on cotton and woolen men's wear, which they will sell through J. M. Harris & Co., New York. The plant, which will be run under the name of the Reno Manufacturing Co., will be superintended by Mr. Hasley who will also do the buying. They will use most 2/20 and 2/26 cotton yarns.

*Wyoming, Laramie. G. E. Morton is to be superintendent of the new wool scouring plant to be established here.

Enlargements and Improvements.

Connecticut, Danielson. The Brigham Woolen Co. is operating the plant overtime. New spinning machinery, including two new mules, has been put in.

Connecticut, Mechanicsville. The French River Textile Co.'s plant has been closed for ten days for purpose of installing a new water wheel.

Connecticut, Norwich. B. Lucas & Co. have installed a new penstock and during installation plant was closed for a few days.

Massachusetts, Clinton. The Earnsdale Worsted Mill is installing 15 new looms besides making improvements in the finishing room.

*Massachusetts, Enfield. Operations have been resumed in the Enfield Mfg. Co.'s plant, closed for making repairs.

Massachusetts, Holliston. The old engine at the Darling Woolen Mills is being removed and will be replaced with one of 400 h. p.

Massachusetts, New Bedford. A large storage shed, 118 by 104 feet, one story, is to be built for the Beacon Mfg. Co.

Massachusetts, Spencer. The Allendale Woolen Co. is replacing 48 of the narrow looms with 24 broad ones.

*Massachusetts, Spencer. The old Wicks Mill, recently secured by the Taylor Woolen Co., is being operated as Mill No. 2. Twelve new broad looms have been installed.

*Massachusetts, Uxbridge. C. A. Root & Co.'s mill has been closed during the present week for making repairs and rearranging the machinery. The finishing machinery will be removed to the new addition which has been built.

New York, Amsterdam. McCleary, Wallin & Crouse are adding a storehouse to the dye plant.

*North Carolina, Spray. The German-American Co.'s new mill, which is three miles from this place, now has a post office address of its own, viz: Draper. Besides the cotton machinery equipment there will be a woolen department erected

later. Seven sets of woolen cards are already at the mill, from the Cleveland Machine Works. They will be set up temporarily in the cotton mill building, until the woolen mill is finished. It is expected that there may be as many more cards added when the plant is finished.

*Nova Scotia. The Hewson Woolen Mills, Ltd., expect to start their new mill running, by January 1, 1907. They will add 10 new looms, 3 sets cards, 1,000 new spindles and about 20 each, knitting and sewing machines. This company is now capitalized at $1,000,000; H. L. Hewson, president; G. J. White, treasurer; D. T. Craig, superintendent of cloth department; and W. A. Ingalls, superintendent of knitting.

Pennsylvania, Philadelphia. The Penn Worsted Company whose mill is located at Hancock & Turner Sts., where they are operating 60 broad looms on men's wear and dress goods, have rented space in the Fretz Building, 10th & Diamond Sts., which they are using as a burling department.

Pennsylvania, Philadelphia. The Wright & Hall Textile Company now at Howard & Jefferson Sts., where they are manufacturing men's wear and dress goods on 65 looms, is reported to remove to the Lomax Mill at Orleans & Jasper Sts., occupying a new addition which is now almost ready for occupancy.

Pennsylvania, Philadelphia. Messrs. George Taylor & Bro., who recently removed their plant from 2627 Mutter St., to the old Armure Tapestry Mills on Fairhill St., above Lehigh Ave., where they are operating about 25 broad looms on men's wear, are about to place an order for 10 more looms and are also contemplating adding another department for the manufacture of narrow fabrics and are now looking up machinery for this purpose. They are very busy.

Pennsylvania, Philadelphia. The Bernstein Manufacturing Co., 3d and Allegheny Avenue, manufacturers of mattress felts, whose plant is equipped with 3 pickers, 3 willows and 2 felting machines, are having erected a new one-story and basement brick building which, when completed, will more than double the capacity of the plant and in which they will install machinery of all kinds for the manufacture of this line of felts. The officers of the company are: W. F. Bernstein, president; E. A. Bernstein, treasurer; J. H. Bradley, superintendent, and W. P. Bernstein, purchasing agent. They have a capital of $225,000 and sell direct.

Pennsylvania, Philadelphia. The Fern Rock Woolen Mills are installing 30 new medium weight worsted looms in the plant.

Pennsylvania, Philadelphia. Erben, Harding & Co., one of the largest manufacturers of worsted yarns in this country, have recently placed a contract with Wm. Steele & Sons Co., for the erection of a new four-story and basement building covering an area of 101 by 153 feet, which will be of reinforced concrete construction. The fire escape towers will be outside of the structure and the building will be absolutely fireproof. The cost of the operation is placed at $110,000 and will be pushed forward to completion as speedily as possible. The location of the building is Milnor and Unruh streets, Tacony, where the company already operates quite a large plant for the spinning of worsted yarn.

Pennsylvania, Philadelphia. Thomas Caves' Sons, proprietors of the Keystone Carpet Mills, 3d and Cumberland streets, where they operate 24 wide and 128 narrow looms on ingrain carpets and art squares, have fitted up a branch plant in the Bromley Mills, Jasper and York streets, with 14 broad looms to be run on art squares.

Rhode Island, Providence. The Weybosset Mills of the American Woolen Co., contemplate replacing some of the looms with 50 new ones. About 12 new looms have already been received.

Rhode Island, Woonsocket. The Woonsocket Spinning Company is installing many new machines in the plant on Front St. They will start running nights next week and have work for five months in advance. D. Servais and J. Rogister are the managers of the plant, and A. Tamboise, treasurer.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

New Jersey, Paterson. It is reported that William Rogers, formerly with the Harmony Silk Co., is to start a new plant in the Barnert Mill. About 40 people will be employed at the start. The mill will have an equipment of 4,000 spindles.

*New York, New Berlin. Work will start at once on erection of new building for the New Berlin Silk Mfg. Co., recently incorporated with capital stock of $25,000 to operate plant here. Broad silks for retail and manufacturing trade will be manufactured. Plant will be equipped with 500 spindles and 50 looms, using steam power. Product will be sold direct. E. E. Elwood is president and manager of the plant and F. T. Arnold, treasurer.

*Pennsylvania, East Allentown. The Astron Silk Company which has been organized recently with capital stock of $10,000 proposes operating a small plant making broad goods. C. M. Iaron has a large interest in the new company.

Pennsylvania, Philadelphia. The Philadelphia Embroidery Mills, is the name of a new concern recently started at 3623 North Lawrence St., the proprietors of which are F. Muhling and Philip Schumann. The plant is located in a new one story building recently erected for this purpose and in it the company has placed two 7 1/2 yard embroidery machines which are run by electricity and operated on silk and mercerized cotton embroideries selling the production direct.

Pennsylvania, Fayetteville. It is reported that the Fayette Silk Company has been incorporated with capital stock of $15,000 and will establish a plant at this place. Mr. Milton R. Long, formerly with Lockman Bros.' mill at Carlisle, will be superintendent of the plant. Others interested are: John B. Long, Waynesboro, Dr. John Eckel and Wm. Culbertson, of Chambersburg. Work will

start shortly on erection of the new building, to be 60 by 75 feet, one story. Operations will start with about 25 operatives.

*Pennsylvania, Scranton. Work has been completed on the new building for the Globe Silk Mill and the machinery will now be installed. It is expected to have the plant ready to start operations within a month.

Enlargements and Improvements.

*New York, Corning. Work is nearing completion on the Merrill Silk Glove Co.'s branch mill at this place. It is contemplated to start operations early in October.

New York, Port Jervis. New machinery is being installed in Katterman & Mitchell's broad silk plant at this place.

*Pennsylvania, Carlisle. The new addition to be built to Lockman Bros. mill will be 120 by 50 feet, three stories. It is expected to have same completed within 90 days. They comtemplate adding about 30 more looms for making black ribbons exclusively.

Pennsylvania, Danville. Additions are to be made at the Danville and Riverside Silk Mills of the F. Q. Hartman group, incorporated as F. Q. Hartman, Inc., and the capital stock has been increased to $365,000. Additional machinery is soon to be installed in the Riverside plant, where an annex is also being built for new boilers. Improvements are also planned at the Danville plant.

Mills Starting Up.

*Massachusetts, Northampton. The Northampton Silk Company has started operations.

*New York, Fultonville. The L. M. Blumstein Silk Fabric Co. is now operating the plant of the Starin Silk Fabric Co., recently purchased. This plant is equipped with 13 looms and 25 sewing machines for making silk fabric gloves, also dye house.

*New York, Saratoga Springs. The Clark Textile Company's plant has been formally opened and about 40 people are employed. When the plant is operated to its full capacity employment will be furnished for about 700 people.

MISCELLANEOUS.

*Massachusetts, Fall River. The Fall River Bleachery is to discontinue steam as a driving power and operate the plant with electricity. The installation of the new plant is nearly completed and it is expected to have a portion of the mill driven by the new power within a month.

*Massachusetts, Lawrence. The Lawrence Dye Works are erecting a building on the South Canal, as an addition to the plant.

Massachusetts, Ludlow. Contract has been let by the Ludlow Manufacturing Associates for two transformer houses, one 34 by 23 feet, one story, and one 12 by 32 feet, two stories. A warehouse, 139 by 164 feet, one story, will also be built.

Massachusetts, New Bedford. The New Bedford Cordage Company contemplates building an addition to the plant which will increase the capacity from 20 to 30 per cent.

Massachusetts, Newton. The Marysville Wool Scouring Company has been incorporated with capital stock of $100,000 for purpose of scouring wool, etc. N. B. K. Brooks is president of the company; John H. O'Brien, (246 Summer street, Boston) treasurer and Austin W. Follett, secretary.

Massachusetts, Plymouth. At recent meeting of the stockholders of the Plymouth Cordage Co., it was voted to increase the capital stock from $2,000,000 to $2,500,000.

Minnesota, Le Roy. The Le Roy Fibre Company's new plant has been put in operation, threshing flax and making tow.

New Hampshire, Meredith. Additional machinery has been received for installation in theAtlas Linen Co.'s mill.

*New Jersey, Bridgeton. Operations will be started November 1st by the Martin Dyeing & Finishing Company, capitalized at $150,000. Wm. L. Martin is president and superintendent of the company and James G. Shaw, treasurer. Plant will be equipped for working on fast black, cotton piece goods and mercerizing and dyeing in fast black. Plant will have capacity of 15,000 lbs. per day. A specialty will be made of oxidized fast black.

New Jersey, Paterson. The Bohl Silk Dyeing Company is erecting a large dye house at Dundee Lake which they contemplate having completed in December. The main building will be 201 by 80 feet; the finishing room, two stories; office building, 58 by 70 feet; store house, 28 by 47 feet and an engine and boiler house.

*New York, North Tonawanda. The Niagara Cordage Co., capitalized at $100,000, expects to have the new building ready for occupancy about Nov. 15th.

New York, Patchogue. Geo. T. Renke is general manager of the Patchogue Refinishing Company which will operate a plant on general dyeing and bleaching, specializing on lace curtains. Frederick Haigh, Paterson, N. J., is also interested in the new company.

Pennsylvania, Philadelphia. The mercerizing plant fitted up by Forrest Bros., at Cottman and G Streets, is no longer in existence. The building is now occupied by a company manufacturing machinery for cleaning carpets.

Pennsylvania, Philadelphia. Messrs. Brandenburger & Co., who, during the spring of the year, took over the silk dyeing plant of John Iliffe at 1114 North Front Street, have discontinued their operations and removed the machinery from the buildings, which are now for rent.

*Pennsylvania, Reading. The Prospect Dye Works will rebuild their plant at Hyde Park, where they propose erecting four new buildings, each one story, 150 by 60 feet. An electric plant of 200 h. p. will be installed.

Rhode Island, Saylesville. A new 500 h. p. gas engine is to be installed in the power plant of the Sales Bleachery. This will give the plant a total of 1,000 h. p.

*Rhode Island, Woonsocket. The Woonsocket Dyeing & Bleaching Co. will start work shortly on erection of an addition to their plant and when completed will have production of 6,000 lbs. per day. This company makes a specialty of dyeing worsted tops.

*Tennessee, Memphis. The American Bag Company has been incorporated with capital stock of $250,000, with L. D. Falls, president; W. H. Carter, vice-president; Hill Bond, secretary and treasurer. A bleachery will be built in connection with the plant, the cotton and burlap to be purchased, but bleached by the company. A new building, including 50 cottages, will be built.

Texas, Dallas. The new building to be erected for the Fulton Bag and Cotton Mills Co., will be five stories and basement, brick.

FAILURES AND SUSPENSIONS.

Connecticut. Danielson. It is reported that the Pequot Worsted Company has made an assignment. C Fred Waterman, agent of the French River Textile Co.'s plant at Mechanicsville, has been appointed trustee.

Massachusetts, Newburyport. Wilmot R. Evans and Frank Brewster have been appointed temporary receivers of the Bay State Cordage Company, upon request made to the court by Albert S. Apsey, receiver of the First National Bank, Chelsea.

*Pennsylvania, Philadelphia. The Arkonia Fabric Manufacturing Co., whose plant was recently reported closed, has failed and the sheriff is in possession.

FIRES.

Canada, Montreal. Fire which started in one of the electric towers of the Dominion Cotton Company's plant, Notre Dame and Desery Sts., caused damage amounting to about $7,000.

Connecticut, Norwich. The Reliance Worsted Company's plant has been damaged by fire which started in the picker room, causing considerable loss on building and contents. Loss is covered by insurance.

Louisiana, New Orleans. Fire, which started in the cotton room of the Alden Knitting Mills, caused damage to the building of about $500, and to the cotton and machinery, of about $2,000. The loss is covered by insurance.

Massachusetts, Fitchburg. Fire in the frame storehouse of the Parkhill Mfg. Co.'s plant caused damage to the extent of $1,500.

Massachusetts, Highlandville. Moseley & Co.'s hosiery mill has been destroyed by fire. The loss is estimated at $30,000 on buildings, machinery and stock; partly covered by insurance.

Massachusetts, Middleboro. About $1,000 damage was done to the Nemasket Worsted Mills, by fire which started in the picker room.

Massachusetts, Worcester. James C. Green's mill has been damaged by fire.

New Hampshire, Manchester. The storehouse of the Amoskeag Manufacturing Co., in which were stored dyes and chemicals, has been damaged by fire. The loss is estimated at about $100,000. The building was 150 by 50 feet, two and one-half stories.

North Carolina, Wilmington. The dye house of the Wilmington Cotton Mills has been destroyed by fire, causing loss of about $15,000; fully covered by insurance.

Pennsylvania, Philadelphia. A recent fire in the cotton yarn mill of Thomas Henry at the corner of Emerald & Westmoreland Sts., damaged the plant to the extent of $3,000. This is the third fire which has occurred in this mill within the past year or two and the firm are under the impression that all of them have been of incendiary origin.

Pennsylvania, Philadelphia. A fire which started in the drying room of the E. G. Chester Dyeing Co., Trenton and Susquehanna Avenues, recently damaged the plant to the extent of $300.

Pennsylvania, Reading. The Colonial Hosiery Company's plant has been damaged by fire recently. The loss is estimated at $5,000.

Pennsylvania, Schuylkill Haven. During a severe storm on the night of Sept. 12, lightning struck and totally destroyed by fire the Eureka Knitting Mills, manufacturers of ladies' and children's underwear on 31 knitters and 20 sewing machines entailing a loss of $25,000.

FACTS AND GOSSIP.

*Alabama, Anniston. We have been advised that the Woodstock Cotton Mill will not rebuild the warehouse destroyed by fire, until next spring.

California, Los Angeles. Work is reported to start soon on erection of a new knitting mill for William Isenberg.

Canada, Fort William. It is reported that the Coats Manufacturing Co., of Canada, Ltd., will locate their works and main offices at this place. The company will have a capital stock of $500,000 and will carry on same busines in Canada, as in Great Britain.

Canada, Montreal. The control of the Penman Manufacturing Co.'s plants at Paris, Thorold, St. Hyacinthe and Coaticook have been secured by Messrs. Yuile, Gordon & Black, of the Dominion Textile Company.

Canada, Nova Scotia, Eureka. The Nova Scotia Woolen Mills are being offered for sale.

Connecticut, Central Village. It is reported that a project is under way to organize a company with capital stock of $50,000 and erect a new mill. It is proposed to purchase the Rollins property for the purpose. About 30 looms will be put in at first.

Connecticut, Middletown. At recent meeting of the directors of the Merchants' Silk Co., William E. Emig was elected assistant treasurer and Mr. Watson made general superintendent.

Connecticut, Plainfield. The Central Worsted Company has been incorporated with capital stock of $50,000. Charles E. Barber and Edward H. Lillibridge (Central Village) are mentioned an interested.

*Connecticut, Stafford Springs. The Central Mills have been sold to Cyril Johnson by the A. B. Paton Mfg. Co., which was organized recently to operate the above plant.

Georgia, Augusta. The Chicago Bagging & Tie Company is reported purchasing machinery for a bagging plant to be established here.

Georgia, Cedartown. John C. Hand is reported as interested in establishing a mill at this place for spinning yarns used in manufacturing duck.

Georgia, Dalton. It is reported that Carl Bivings of this place, and John G. Donaldson of St. Louis, Mo., contemplate erecting a knitting plant at this place for manufacturing hosiery.

Georgia, La Grange. The La Grange Mills are reported to build an additional opening room and install blowing equipment for cotton.

Massachusetts, Blackinton. The Blackinton Manufacturing Company is operating the spinning, dressing and weaving departments nights.

Massachusetts, Boston. The Boston Yarn Company, which has been reported incorporated recently, will conduct a general yarn brokerage business and will also be selling agent for the new Le Roy Cotton Mills Co., of Le Roy, N. Y. Mr. Channing Robinson, for several years with the New England Cotton Yarn Co., will be manager of the Boston Yarn Company; P. T. Jackson, Jr., president, and Myron C. Taylor, treasurer.

Massachusetts, Cherry Valley. The Pfaffman Woolen Mill has been reported closed for an indefinite time, owing to poor condition of the market.

*Massachusetts, Concord. The Strathmore Worsted Mills have been incorporated with capital stock of $150,000, with A. Adie, president, and J. D. Coit, treasurer. This company will operate the plant formerly known as the Concord Mills.

*Massachusetts, Easthampton. W. M. Lovering of Taunton, has purchased the controlling interest in the National Felting Company and will assume management of the plant.

*Massachusetts, Holyoke. We have been advised that the Bullard Thread Co. has purchased no land, as recently reported. The transaction was a personal one, the land having been purchased by W. H. Bullard, who controls the majority of stock in the Bullard Thread Co. It is possible that the land may be turned over to the Bullard Co. later, but at this time no definite steps have been taken for so doing.

Massachusetts, Jefferson. The Jefferson Manufacturing Co. has been incorporated with capital stock of $100,000 to continue the plant being run by company of the same name. The directors of the new company are; Martin V. B. Jefferson, William H. Coe and Charles A. Merrill.

Massachusetts, Medford. The explosion of a large dye vat in the Crowa Dye Works destroyed portion of roof of building and injured two employees.

Massachusetts, New Bedford. It is reported that bids are to be received for a new mill to be erected on the property recently purchased by the Harding-Whitman interests.

Massachusetts, North Adams. The final meeting of the creditors of the Winsor Print Works will be held in New York before Referee Townend, Sept. 10.

Massachusetts, Plymouth. The power house of the Plymouth Mills has been wrecked by bursting of one of the dams.

Massachusetts, Worcester. Thomas Williams, operating a shoddy and woolen mill at this place is to retire from business and the plant is being offered for sale. A public auction will be held Oct. 5th.

*Michigan, Lexington. It is stated that John L. Fead & Son will locate their entire plant at Port Huron, where they have been operating a branch mill.

New Jersey, Burlington. The Burlington Silk Weaving Co., which has been running their mill short time for several months are about to start up all their looms within a few days. The plant contains 85 looms, run on broad silks. The proprietors of the plant are McDonnell, Stout & Co., 1011 Filbert St., and the superintendent is John Norris.

New Jersey, Paterson. The Eagle Silk Co., 93 River Street, in the hands of receiver, Clifford L. Newman, has been sold to Leonard DeWitt.

*New York, North Tonawanda. The Gloversville Textile Company will hereafter be known as the Niagara Silk Mills. The principal office will be at this place.

New York, Rensselaer. Parties interested in establishing a glove factory at this place are conferring with the Chamber of Commerce in regard to site, etc. They ask for a site with water and rail shipping facilities and a large strip of land. Action will be taken at the next meeting of the Chamber of Commerce, Sept. 14.

New York, Stittville. The Stittville Knitting Mill, formerly operated by Hackett & Atwood, but morerecentlybyMr. t mh m thes tcm tcm tvbhthh more recently by Mr. Hackett, has been purchased by Geo. A. Frisbie and Chas. S. Symonds, of Utica. The plant will be continued in operation at this place and the output may be increased.

North Carolina, Concord. It is reported that two large cotton mills are to be built at Kannapolis and that they will be organized as the Annapolis Mills. About $2.000,000 will be expended for erecting weaving and spinning mills. James W. Cannon is reported as interested.

North Carolina, Louisburg. The Tar River Mfg. Co., reported last July, is a new concern which is known as the Tar River Mattress Com-

pany and proposes starting operations Oct. 15th, making bed comforts. They are in the market for materials, samples and prices. J. W. Hollingsworth is manager of the company.

North Carolina, Nicajack. Mrs. J. Lindsay Johnson has purchased the Concord Woolen Mills for $25,000. The mills will be continued in operation under management of John C. Prinup.

Ontario, Galt. The Crown Hat Co. has been incorporated with capital stock of $50,000 for purpose of manufacturing hats, caps, etc. C. C. Stauffer, R. Scott and F. S. Scott are among those interested.

Oregon, Salem. The project of establishing a linen mill is being agitated. It is stated that a large concern in Ghent, Belgium, proposes locating a branch mill here and that Geo. Verbeke is here in the company's interests.

Oregon, Union. The Oregon Woolen Mills are to be closed or sold as the proprietor desires to retire. John P. Wilbur, H. J. Lucas and others have offered to take a large part of the stock but this would leave some $10,000 more necessary before project would pay and if subscribers can be secured for that amount, the plant may be continued.

Pennsylvania, Chester. It is reported that parties are considering taking over the Trainer Mill and operating same as silk mills.

Pennsylvania, Doylestown. C. Holmes & Sons, proprietors of the Clear Spring Worsted Mills, manufacturers of fine serges, cheviots, etc., on 26 broad looms, state that business with them is beginning to pick up. The worsted yarn spinning department containing 2,600 spindles is being operated by Messrs. Wm. Lund & Son, of 2d and Erie Streets, Camden, N. J., spinners of worsted yarns and with 1,360 spindles.

Pennsylvania, Erie. The Chamber of Commerce has been actively interested in securing the location of a silk throwing plant in this city.

Pennsylvania, Philadelphia. The Arkonia Fabric Mfg. Co., recently reported by us as going into bankruptcy, was sold out by the receiver, William Potter Davis, Jr., Esq., at public sale on Friday, Sept. 28.

Pennsylvania, Philadelphia. Thomas Boggs has transferred to Thomas Boggs & Sons, Incorporated, manufacturers of ingrain carpets, the three-story factory building at the northeast corner of 2d Street and Allegheny Avenue, where they are now located, for a consideration of $100,000. The assessed valuation is $60,000. The lot measures 109 by 250 feet.

Pennsylvania, Philadelphia. A charter has been asked for the American Fabric & Rug Co., by Spencer P. Hazard, Samuel Hazard and Albert Glyndon Priestman.

Pennsylvania, Philadelphia. Philip A. Green, formerly with Ellis Jackson & Co., 18 North Front St., has recently severed his connection with that firm and is now handling the production of the Crefeld Waste & Batting Co., of Saylesville, R. I., and the South Atlantic Waste Co., of Charlotte, N. C., as general sales agent for both companies. Mr. Green's office is at 617 Mariner & Merchant Building, 3d and Chestnut Sts., Philadelphia.

Pennsylvania, Philadelphia. The partnership existing between Arthur Rhodes and A. L. Dyson, operating a plant for the manufacture of art squares under the name of Rhodes & Dyson at Oxford & Josephine Sts., Frankford, has been dissolved, the business in the future will be conducted by Mr. Arthur Rhodes under his own name.

Pennsylvania, Philadelphia. Miller & Sons Company has been incorporated with capital stock of $75,000, with Joseph Miller, president; John G. Johnston, Jr., secretary and Charles R. Miller, treasurer and superintendent.

Rhode Island, Alton. It is reported that the Alton Manufacturing Company, manufacturers of lace, has let contract for the erection of a new mill at this place. The new building will be 225 by 80 feet, brick, one story, with an engine house, 71 by 70 feet, one story, brick.

*Rhode Island, Arcadia. Messrs. Gordon & Tillinghast, who have succeeded the Roger Williams Cotton Mills, will operate same on cotton yarns, 15s to 40s. Geo. C. Gordon is agent of the plant and F. H. Congdon, superintendent. Mill is equipped with 4,032 mule spindles and 4,000 ring spindles. Product is sold direct.

Rhode Island, Ashaway. The Ashaway Woolen Company is reported to close the plant this week for one or two weeks.

*Rhode Island, Central Falls. The Farwell Worsted Mills have been placed in hands of A. E. Conant, Lowell, mill auctioneer.

*Rhode Island, Pawtucket. The exterior of the new building for the Providence Braid Company has been completed and it is expected the plant will be read for occupancy within a few weeks.

*Rhode Island, Washington. The Elite Spinning Co. has been incorporated with capital stock of $50,000 and will continue to operate plant of same name, making wool yarn and cotton, wool and worsted twisting. J. Howard Dews is president of the company; Joseph Dews, treasurer; and J. Fred Dews, superintendent. Plant is equipped with two sets cards and two new sets will be added

South Carolina, Greenville. The executive offices of the Olympia, Richland, Capital City and Granby Mills have been removed from Columbia, to this place.

South Carolina, McCormick. The McCormick Land & Lumber Company has been reported organized for purpose of building a cotton mill and other industries. Real estate belonging to Cyrus H. McCormick, of Chicago, has been acquired.

*South Carolina, Newberry. Improvements have been about completed by the Ashley Manufacturing Co., and operations will be resumed in the mill during September. Seamless half hose will be made.

South Carolina, Pelham. The Pelham Mills which have discontinued their knitting department for some time have disposed of the machinery.

*Massachusetts, Franklin. Operations have begun by the J. W. Linnehan Worsted Co., making fine worsteds for men's wear. The plant is equipped with 34 looms and operated by steam. William Sportman is superintendent of the plant and J. W. Linnehan (88 Broad St., Boston), buyer.

Massachusetts, Pittsfield. The Bel Air Mill has been closed owing to low water. The Davies & Mahoney Co. has started removing their machinery to the newly acquired plant at Adams, Mass.

Tennessee, Morristown. The Morristown Woolen Mill has been closed. The plant is offered for sale.

Tennessee, Shelbyville. J. B. Frierson has been recently elected president of the Sylvan Cotton Mills Company; T. M. Robinson, vice-president and W. J. McGill, secretary, treasurer and general manager. New machinery has recently been installed in the plant, greatly increasing capacity.

Texas, Gonzales. The Gonzales County Farmers' Union Warehouse Company has applied for a charter. They will erect an iron-clad cotton warehouse. Geo. Minear is president of the company; H. A. Porter, secretary; and E. A. Minear, treasurer.

Virginia, Fredericksburg. The Melville Woolen Mills contemplate operating a pants factory in connection with their mill.

Personals.

J. S. Thomas has resigned his position as superintendent of the Tyger Cotton Mills, Fairmount, S. C., after two years of valuable service.

Jacob Ashler, who has been employed as overseer of carding at the Hawthorne Mills, Glenville, Conn., has resigned.

John J. Cantlin has accepted the position as overseer of carding for the Berkeley Woolen Company, Wales, Mass. He was formerly employed by the Garland Mills of Stafford, Conn.

S. M. Burgess, the newly appointed superintendent of the Onoko Woolen Mills, New Bedford, Mass., has taken up his duties at the mill. He was formerly employed at the Globe Woolen Mills as designer. Everett S. Wells, formerly of the Saugus Mfg. Company, Saugus, Mass., has accepted a position as assistant designer at the Globe Mills, Utica, N. Y.

John McCabe has accepted the position as assistant superintendent of the Saylesville Bleachery, Saylesville, R. I. He was formerly with the Mt. Hope Finishing Company, North Dighton, Mass.

Wm. J. Rollison, overseer of finishing for the Mianus Mfg. Company, Coscob, Conn., has resigned, and his place has been filled by Stanley Morrel, who has been employed by this company.

Herbert Fitz Roy, who has been overseer of finishing for the Beoli Mills, West Fitchburg, Mass., has resigned to accept a position as overseer of finishing for the French River Textile Company, Mechanicsville, Conn.

John McCauley, overseer of the finishing for the French River Textile Company, Mechanicsville, Conn., has resigned. He was formerly employed for the Putnam Woolen Mills Company, Putnam, Conn.

James H. Hendry, superintendent of the Brookville Woolen Mills, Brookville, Pa., has resigned. M. F. McNurney, overseer of dyeing for this company, has also resigned.

Fred H. Richardson, who held the position as overseer of weaving for the Lonsdale Company for a number of years, has accepted a more responsible position with the Cocheco Mills, Dover, N. H.

Chas. Greenwood, for a number of years designer for Fred L. Sayles & Co., Pascoag, R. I., has resigned to accept a position at the Earnscliffe Mills, Olneyville, R. I.

C. C. Miller has resigned his position as boss dyer for the Marlboro Cotton Mills, McCall, S. C.

John F. Kirke, who has been superintendent of the weaving at the mills of the Slater Cotton Co., Pawtucket, R. I., since 1902, has been promoted to general superintendent of the entire concern. He was formerly with the Cocheco Mfg. Co., Dover, N. H.

W. D. George, formerly with the Watts Mill, at Laurens, S. C., has accepted the position as chief engineer and master mechanic at the Arkwright Mills, Spartansburg, S. C.

W. D. Cowan, of Holyoke, has accepted the position with the Hadley Mills, South Hadley Falls, Mass., as overseer of the preparatory department.

Richard O'Donnell, who had held the position as boss dyer for the Oakland Woolen Mills, Oakland, Me., has accepted the position as overseer of dyeing for the Indian Spring Mills, Madison, Me.

T. A. Hightower, who has been second hand with the Hope Mills, N. C., Mfg. Co., will take charge of the weave room at Cherokee Falls, S. C.

T. J. Thornton, of Reynoldsville, has been engaged as overseer of finishing for the Indiana Woolen Mills, Indiana, Pa. Harry Kane, formerly employed as carder and spinner for this company, has again taken charge of carding and spinning.

L. B. Foster, who has been for the past six years superintendent of Scottdale, Ga., cotton mills, has accepted the position of superintendent of the Kansas City, Mo., cotton mills, which will start up in the near future with 5,000 spindles, which is soon to be increased.

C. E. Wisner, for the past four years connected with the mills in La Grange, Ga., succeeds Mr. Foster as superintendent of the mill at Scottdale.

M. C. Johnson has resigned his position at Egan, Ga., and has become overseer of spinning, spooling, warping and twisting at the Monroe, Ga., cotton mill.

J. A. Crosby has resigned his position at Forest City, N. C., and has taken charge of carding at Cherokee Falls, S. C.

J. W. McElhannon, who has been for some time second hand in weaving at New Holland, Ga., has been promoted to overseer of No. 2 weave room at same place. He is succeeded by J. L. Foster as second hand in room No. 1, and W. H. Hale still holds the position as second hand in No. 2.

Walter B. Devoe, formerly superintendent and designer for the Hopeville Mfg. Co., at Worcester, Mass., has resigned, and been succeeded by Irving J. Johnson, formerly at Quinebaug, Conn.

Peter Roscalli, an employe at the Stockton Woolen Mills, Stockton, Cal., while repairing a pipe over a wool cleaner while the machine was in motion, missed his footing, falling into the machine and the fast revolving knives cut his body into pieces. He was 26 years of age, single.

T. J. Brennon, who has been local manager of the American Woolen Mills Company at Waterbury, Conn., is to take charge of their new branch store at Hartford, Conn.

Albert A. Davis, who resigned his position as overseer of the carding, picking and combing department in the Hamilton Mills, was pleasantly surprised at his residence by a number of his former employes, who showed their appreciation of his services while overseer. Peter Mulligan, in a neat little speech, in behalf of the body and in behalf of those assembled, presented Mr. Davis with a purse containing quite a large sum of money.

H. Slovern, superintendent of the Sweetwater Hosiery Mills, has resigned and will locate with his family at Athens, Ga.

W. R. Howe, for several years superintendent of the finishing room of the Johnstown Hosiery Mills, Johnstown, N. Y., has accepted a similar position with the Ontario Knitting Company, Oswego, N. Y.

Thomas Wilmarth, for the past 23 years superintendent of the Saundersville Cotton Mills, Saundersville, Mass., has resigned. During the period that Mr. Wilmarth was superintendent of this mill he took a great interest in politics and he was for nine years one of the selectmen. He intends making a tour to the South.

James Hall, who formerly held the position as overseer of carding at the Brigham Woolen Company, Dayville, Conn., has accepted a position as overseer of carding for the Kent Woolen Company, Jamesville, Mass., J. J. Driscol having resigned.

Jos. Schiffers, formerly of Passaic, N. J., has accepted a position as overseer of dyeing for the Brookville Woolen Company, Brookville, Pa.

Arthur D. Lowe has been appointed superintendent of the Hargraves No. 1 mill to succeed E. E. Bartlet, who has been transferred to the Parker Mills, Warren, R. I.

Daniel Driscol has accepted the position as foreman in the Wood Worsted Mills, Lawrence, Mass.

T. J. Nevins, formerly overseer of weaving at West Conshohocken, Pa., but later with the Ottaquechee Woolen Company, No. Hartland, Vt., has accepted a similar position with the Branton Woolen Company, Newport, N. H.

John F. Kirk has been appointed general superintendent of the Slater Cotton Co., of Pawtucket, R. I. He was superintendent of the weaving department and was a resident of New Bedford, Mass.

Charles E. Thomas of Woonsocket, R. I., who was agent for the Forestdale Mfg. Co., of Forestdale, before the plant was sold, has accepted the position as manager of the B. B. & R. Knight cotton mill and bleachery at Pontiac, R. I.

W. M. Stitt has taken a position with the Cannon Mfg. Co., of Concord, N. C., as cotton buyer and will locate at Charlotte, N. C.

Walter L. Wilson, overseer of the cloth rooms at mills 1, 2, and 3, of the Pelzer Mfg. Co., of Pelzer, S. C., has resigned to accept a similar position with the Olympia Mills, of Columbia, S. C.

A. F. Brannon, who formerly superintended both the Union and Buffalo Mills, at Union, S. C., now has charge of the Buffalo mill only. He is succeeded at the Union mill by W. D. Cooksey, who was assistant superintendent of that plant.

L. H. Cromer, formerly with the Bellerne Mill, at Rockhill, S. C., has succeeded G. A. Gong, as superintendent of the Aetna Cotton Mills, Union, S. C.

William Lister, for the past four years bookkeeper with the Bell Vue Mills Co., Clinton, Mass., has severed his connection with that firm.

T. M. Crowell, formerly with the Oxford Cotton Mills, Oxford, N. C., has accepted the position as manager and superintendent of the Spray Cotton Mills, Spray, N. C.

Henry Barker, for a number of years overseer of weaving at the Parkhill Mfg. Co.'s mill C, has accepted a similar position with the Corr Mfg. Co., of East Taunton, Mass.

J. V. McCombs, formerly with the Highland Park Mills, of Charlotte, N. C., now holds the position as overseer of spinning, spooling, and warping at the Carolina Cotton Mill, at Graham, N. C.

W. M. Sherard, superintendent of the Norris Cotton Mills, at Cateechee, S. C., has resigned to accept a similar position with the Jackson Mills, of Iva, S. C.

J. M. O'Brien has been appointed manager of the Riverdale Mills, Great Barrington, Mass.

Thomas E. Ainley, formerly overseer of carding for the American Woolen Company's Mill at Uxbridge, has accepted a position as overseer of carding at the Kennebec Mills, Fairfield, Me.

A. L. Bassett, superintendent of the Jonesville Mfg. Co., at Jonesville, S. C., has resigned and will move to Goldsboro, N. C.

S. F. Brown has resigned as overseer of spinning at the Dan River Mills, Danville, Va., and is now assistant superintendent of the Woodstock Mills, at Anniston, Ala.

G. W. Etheredge, formerly of Woodruff, S. C., now holds the position as superintendent of the Lockhart Cotton Mills, Lockhart, S. C.

J. R. Lodge, overseer of spinning for the Pocahontas Cotton Mill Co., of Ettrick, Va., has severed his connection with that firm, he is succeeded by David Gates, formerly with the Manchester Cotton Mills, of Rock Hill, S. C.

Henry K. Drew, formerly superintendent of the Clinton Mills, of Woonsocket, R. I., but more recently with the Fulron Bag & Cotton Co., of Atlanta, Ga., has accepted a position as superintendent of the B. B. & R. Knight Mills at Riverpoint, R. I. He will assume his new duties Sept. 10, and will have charge of the Royal Valley, Queen, and Arctic Mills.

C. A. Davis, formerly of Penacook, N. H., has succeeded William Lindsay as superintendent of the woolen mill of the J. C. Parker Co., of Queechee, Vt.

Edward F. Dempsey has been engaged as overseer of weaving for the Mann & Stevens Woolen Mills, at East Brookfield, Mass.

J. A. Knight, formerly superintendent of the Bristol Mill, New Bedford, Mass., now holds a similar position with the Argo Mills Co., of Gloucester City, N. J.

Walter Miller, formerly overseer of weaving for the Corr Mfg. Co., of Taunton, Mass., is now with the Hathaway Mill, at New Bedford, Mass.

James Morton, of Oakland, Me., has accepted the position as general manager of the Western Woolen Mills Co., of Topeka, Kans.

Fred H. Richardson, overseer of weaving at the Lonsdale Company, of Lonsdale, R. I., has severed his connection with that firm.

John Thompson, for the past 12 years an overseer in mills 5, 6 and 7 of the Dwight Mfg. Co., of Chicopee, Mass., has resigned.

Arthur Dubuque has taken the position as overseer of ring spinning, spooling and warping at the Lawton Mills, of Plainfield, Conn.

Howard E. Troutman, for over ten years connected with the Buckeye Engine Company, and for several years manager of its Chicago office, has resigned to accept the sales management, Corliss and High Speed Engine Department of the Atlas Engine Works, Indianapolis. Mr. Troutman's headquarters will be at the home office.

J. V. Jones, formerly of Greenville, S. C., who has been for some time in the Liberty Cotton Mill, has just taken charge of the spinning room at Central, S. C.

H. A. Neil, the famous cotton expert and statistician, and partner in the firm of Neil & Co., cotton merchants of New Orleans and London, is dead. Mr. Neil's estimates and reports have been recognized for many years as carrying great weight in the trade.

John Hinchcliffe, overseer of weaving at the Wakefield Mfg. Co., at Wakefield, Mass., has resigned and is succeeded by R. Sherman.

Joseph Scott is now overseer of Spinning at the Cheshire Mills, succeeding Sidney G. Brown, who has resigned.

John Brown, an overseer with the American Thread Co., for 41 years, has resigned his position at the Kerr Thread Mills, at Fall River, Mass.

S. N. Burgess, formerly designer at the Globe Woolen Co., at Utica, N. Y., has been appointed superintendent of the Oneko Woolen Mills, of New Bedford Mass.

William S. Taylor overseer of finishing for the Brookville Woolen Mills, at Brookfield, Pa., has resigned.

C. D. Risley, for the past two years overseer of finishing for the W. E. Tillotson Mfg. Co., of Pittsfield, Mass., has resigned.

Eugene D. Talford, formerly with the Boott Cotton Mills and the Merrimack Mfg. Co., has taken the position as overseer of weaving for the Lowell Weaving Co., at Lowell, Mass.

A. F. Hormann, overseer of carding for the French & Ward Co., has resigned and is succeeded by John Rose. of Hope Valley, R. I.

Robert Driver, for many years an overseer in the Arlington Mills, at Lawrence, Mass., has resigned to accept a position in the Wood Worsted Mills, at Lawrence.

Chas. Hanover has accepted the position as overseer of mule spinning at the Parker Mills, at Warren, R. I., to succeed James Andrews, resigned.

P. L. Sullivan, of Holyoke, Mass., has taken the position as overseer of dyeing at the Boston Duck Co., at Bondsville, Mass., succeeding Mathew McKenzie.

James F. Dewey has been promoted to the superintendency of the A. G. Dewey mills of Quechee, Vt., succeeding V. J. Brennan, who resigned.

John Sullivan, for a number of years overseer of spinning at the Social Mill at Woonsocket, R. I., has resigned and is succeeded by Albert Bentley, formerly at the Manchaug Mills, at Manchaug, Mass.

J. F. Kerrigan has succeeded James J. Grady as overseer of carding at the Brigham Woolen Co., at Danielson, Conn.

J. M. Broucher, of the Brownell Company, Dayton, Ohio, has resigned his connection with that company to accept the position of Assistant General Managership of Sales for the Atlas Engine Works, of Indianapolis.

John Fagan, formerly designer and assistant superintendent of the Hinsdale Woolen Mills, at Hinsdale, Mass., is now designer and superintendent of the Cromwell Woolen Mills, at Newcastle, Del., succeeding J. H. Lord.

J. Paquette, overseer of finishing at the Millbury Worsted Mills, West Millbury, Mass., has severed his connection with that mill.

S. Widdows has succeeded J. E. White as overseer of spinning at the Pondicherry Mill, at Bridgton, Me.

Henry D. Martin, superintendent of the Parker Mills, at Warren, R. I., has tendered his resignation to take effect in the near future.

C. D. Maigitter, formerly of Gastonia, N. C., has taken the position as overseer of weaving at the Chadwick Mill, of Charlotte, N. C.

William Hill, formerly overseer of dressing at

the Pemberton Mills, of Lawrence, Mass., has resigned to take a similar position at the Nashua Mfg. Co., of Nashua, N. H.

Henry J. Parker, overseer of ring spinning for Morris & Company, at Groveville, N. J., has resigned.

Thomas Hudson, overseer of weaving for Adam Lomas & Son, Sherbrooke, Que., has resigned to take a position with the Oxford Mfg. Co., of Nova Scotia.

J. W. Saunders has resigned his position as superintendent of the Tuscaloosa Mills, of Tuscaloosa, Ala.

Wilfred Mornington, overseer of spinning at the Abbott Worsted Co., of Forge Village, Mass., has resigned to take a position with M. J. Whittall, in Worcester, Mass.

James J. Giles, overseer of weaving at the Athens Woolen Mills, at Athens, Tenn. has resigned and gone to Louisville, Ky.

L. D. Pitts, formerly connected with the Laurens Cotton Mills, Laurens, S. C., has accepted the position as secretary of the Aragon Cotton Mills, at Rock Hill, S. C.

J. W. White, formerly overseer of carding at the Cedartown Cotton Export Company, has accepted a position with the Atlantic and Fulf Mill, Quitman, Ga.

J. A. Walker has resigned the position as spinner at White Oak Mills, position of carder at Bessemer City Cotton Mill, Bessemer City, N. C.

W. H. Sanders, formerly overseer of spinning at the Dixon Mill, Laurinburg, N. C., is now in charge of the spinning room of the Golden Belt Mill at Durham, N. C.

J. A. Jenkins has resigned his position at Warrenville to become overseer of carding in the mills at Lockhart, S. C.

A. H. Bradley, from the Pepperton Mill at Jackson, Ga., has returned to his old position as overseer of spinning at Abbeville, S. C., which he had formerly held for five years.

J. R. Donaldson has resigned the position as overseer in the weave room of the Gluck Mills, at Anderson, S. C., and will be with one of the mills at Lafayette, Ga.

H. J. Sleigh, who had been for some time overseer of the cloth room of the Walhalla Cotton Mills, has accepted a position as manager of the Farmers' Warehouse at Spartansburg, S. C. He is succeeded at Walhalla by Thos. B. Rector from Duke, N. C.

C. W. Rice, who has been for several years connected with the operation of mills at Anderson, S. C., is the new superintendent of the Norris Mill, at Cateechee, S. C.

J. J. Gunn, formerly engineer and master mechanic at Raccoon, Ga., has accepted the position of card room overseer for the Alabama Cotton Mill at Speignors, Ala.

Wm. Barrett, who has held a position as second hand in the dressing room of the Appelton Mills, Lowell, Mass., has accepted a position as overseer of cone winding for Frank, Pels & Company, New Durham, N. J.

E. E. Bartlet, superintendent for the Hargraves Mills of Fall River, Mass., has been appointed superintendent for the Parker Mills, Warren, R. I. Mr. Bartlet has had a wide experience in large mills in New England and also in the south.

Frank W. Besser, who has held the position as overseer of weaving for a number of years in large mills in Rhode Island, has accepted the position as overseer of weaving for George H. Gilbert Mfg. Company, Gilbertville, Mass.

James W. Williams, formerly of Newburgh, N. Y., has accepted a position as overseer of carding for the Madison Woolen Company, Madison, Me.

James J. Grady, formerly overseer of carding at the Brigham Woolen Company, Dayville, Conn., has accepted a position as overseer of carding for the Norfolk & New Brunswick Hosiery Company, New Brunswick, N. J.

Henry J. Parker, who resigned the position as overseer of spinning at Groveville, N. J., has accepted a position as overseer of spinning, spooling and warping at the Williamsville Mfg. Co., Killingly, Conn.

Chas. W. Hanchox, formerly of Columbus, Ga., has accepted the position as superintendent for the Altamahaw Cotton Mills, Eaton College, N. C.

Clifton Thornton has resigned his position as a second hand in the Ann & Hope Mills, Lonsdale, R. I.

George Crane, formerly superintendent for the Mt. Battie Mills, at Camden, Me., has accepted the position as superintendent for the Riverside Mills, at Stafford, Conn.

H. D. Martin, who has held the position as superintendent for the Parker Mills, Warren, R. I., for the past 10 months, has resigned. He is to accept a position at the Lancaster Mills at Clinton, Mass.

George W. Dunn, formerly pay master at the Parkhill Mfg. Company, Fitchburg, Mass., has been appointed purchasing agent of the Lancaster Mills at Clinton, Mass., by Arthur H. Lowe, general manager of this mill. William M. Forbes will succeed Mr. Dunn as pay master.

Fred M. Richardson of Cherry Valley, Mass., has taken a position in the office of the Whitall Mills, Worcester, Mass.

Louis Corey, second hand in the spinning department of the Jefferson Mfg. Company, Jefferson, Mass., has been promoted to overseer of spinning.

W. C. Hitchcock has been appointed overseer of weaving at Holden Leonard Company's Mill at New Bedford, Mass.

James T. Prosser of Suncook, N. H., has been engaged as overseer of the weaving department at No. 4 Mill of the Lonsdale Company. Mr. Prosser will fill the vacancy caused by the resignation of Fred H. Richardson, the present foreman, and will enter upon his duties September 24.

Fred Frary, overseer of spinning at the Berkshire Cotton Mfg. Company, No. 4 Mill, Adams, Mass., has resigned his position to accept a similar one with the Manchaug Company, Manchaug, Mass.

A. H. Lowe, the new president of the Lancaster Mills, Clinton, Mass., has appointed Dexter Stevens, superintendent of carding, spinning and warping. Mr. Stevens was formerly with the Parkhill Mfg. Company, Fitchburg, Mass.

Edward H. Pero, who has held the position as overseer of finishing at Bonaparte, Ia., has resigned and is now located at Apalachin, N. Y. Mr. Pero is a first-class finisher and has had a wide experience in large mills on the Pacific coast.

R. C. Bailey, formerly overseer of finishing for the Hudson Blanket Mills, Hudson, Mass., has accepted a position as overseer of finishing for the Camden Woolen Mills, Camden, N. Y.

Jos. Nuttall, formerly of Shelton, Conn., has accepted a position in the carding room with the Otis Company, Ware, Mass.

W. H. Rivers has accepted the position as overseer of spinning for the Fletcher Mfg. Company, Providence, R. I.

W. A. Booth, overseer of weaving for the Geo. H. Gilbert Mfg. Company, Gilbertville, Mass., has resigned, after five years of service at this mill.

Geo. W. Taylor, general manager of the Oakland Woolen Company, Oakland, Me., has resigned. Mr. Taylor supervised the building of this mill from the ground to its completion. This mill for the past four years has been very successful.

Manuel Gray, engineer for the Stanley Woolen Company, Uxbridge, Mass., has resigned his position. He was formerly at Taunton, Mass.

T. H. Donlevy, superintendent for the Brigham Woolen Company, Dayville, Conn., has resigned. Mr. Thos. Maxwell, formerly of the Assawauga Company, Dayville, Conn., succeeds Mr. Donlevy at the Brigham Woolen Company.

Harry Haigh has accepted a position as overseer of dyeing for the Hugh Wallace Co., Detroit, Mich. Mr. Haigh was formerly employed at the Maine Woolen Co., Old Town, Me.

John Balloch, formerly of the Merrimack Print Works, Lowell, Mass., has accepted a position as assistant superintendent for the Southbridge Printing Co., Southbridge, Mass.

Deaths.

A. P. Alewine, for some time bookkeeper in the cloth room of the Brogan Mills, at Anderson, S. C., died at his home in Anderson, Aug. 23rd. He is survived by his wife and several children.

Gabriel Gernshym, of New York, a retired knit goods manufacturer, died at Sharon Springs, N. Y., of heart disease at the age of 77 years. He invented several new processes in the manufacture of knit goods.

Theodore Hooper, of Baltimore, Md., died last week at Clifton Springs, N. Y. He was the senior member of the firm of William E. Hooper & Sons, cotton duck manufacturers, and was 69 years old. Mr. Hooper was born in Baltimore, and had lived there all his life. He was a member of the Maryland University and Baltimore Country Clubs. Mr. Hooper leaves a wife and two daughters.

John Frederick Mason, for many years a resident of Worcester and president of the Mason Brush Works, died at the Massachusetts Hospital, Boston, Mass., of pneumonia. Mr. Mason had been in failing health for some time and had taken a trip abroad recently in company with his sister to try to regain his health. He was born in Worcester, 63 years ago. He is survived by a wife and four sons.

Henry M. Niell one of the best known cotton statisticians both in this country and in England, was struck by a trolley car at New Orleans, Ala., and instantly killed. Mr. Niell, while waiting for a car, stood too close to the track and in this way met his death. He was for many years in the cotton business in New Orleans, being a brother and local representative of the firm of Niell Brothers & Company, of London, England. He was at one time considered by English spinners one of the greatest crop authorities in America. He was born in England, 78 years ago.

Richard Thackeray, one of the best known cotton manufacturers of Fall River, Mass., died today after an illness of five weeks, from stomach trouble. When the Weetamoe Mills were built in 1871 Thackeray was overseer of the weaving department, and since 1882 he had been superintendent of these mills. He was born in England 71 years ago, but most of his life has been passed in Fall River.

A cablegram from Paris announces the death on September 12th of Joseph M. Bassett of the Johnson & Bassett Company of Worcester, builders of woolen machinery. Mr. Bassett had recently been married and was on his wedding trip. His sudden death comes as a great shock to his family and friends and wide circle of business acquaintances.

George P. Gray, general manager of the Victor Knitting Mills, of Cohoes, N. Y., died suddenly at his home in Albany of apoplexy. Mr. Gray was born in Dorset, Vt., about 57 years ago and went to Cohoes when quite young. Later he went to Brooklyn to live and returned to Cohoes about 15 wears ago. He became a stockholder in the Victor Knitting Mills and was subsequently made its secretary and general manager. He is survived by his widow and two children.

M. W. Quinn, for the past 19 years agent for the Hamilton Woolen Company's mills at Amesbury, Mass., died in London, Eng., last week, at the age of 62 years. Mr. Quinn had been in failing health for the past year, and in company with a daughter was making a tour of Europe. He was born in the north of Ireland, in 1844, and came to this country at an early age, his parents locating at Victoria Mills, N. Y. He is survived by two sons, James, who is acting agent of the local mills, and Fred A. Quinn, who is agent of the mills at Fiskdale, and two daughters.

Mark D. F. Speere, for many years agent of the old Amesbury and Salisbury mills, died at Amesbury, Sept. 12th, at the age of 84.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

The Tariff Revisionist; An Example of the Nature of His Demand; by William Whitman, Boston, Mass.; price 10 cents.

In this pamphlet the author calls attention to the unity of interests between all parts of the United States and the folly of the demand by one section of the country, such as Massachusetts, for special tariff advantages. It is a short-sighted policy to clamor for free raw materials for Massachusetts industries when those raw materials are the finished products of some other section. Mr. Whitman lays emphasis on this point and has arranged a very strong argument in support of the advice to let well enough alone. We are prosperous and want no change.

Principles of Worsted Spinning; by Howard Priestman; 302 pages, 5 1/2 by 8 1/2; Longmans, Green Co., New York. Price, $2.50.

This book begins with a very well-written historical sketch, which, nevertheless, might have been omitted with advantage. The primitive methods of spinning by the ancients are always of interest, but have been well described an innumerable number of times and need not burden a technical handbook intended for the practical worsted worker. Under the head "Material and Qualities" the author has succeeded in shedding considerable light on subjects that can be understood only by practical experience and daily contact with the material in process of manufacture. Under the heads "Spindle Theories" and "Drafting and Ratch" the author gives much useful information and shows plainly that he has studied his subject carefully. The most serious defect in the book is developed in the fifth chapter, where the author appears as a staunch advocate of the metric system. He begins his pro-metric argument with a general denunciation of English weights and measures. The use of ounces and yards for top, drams and 40-yard lengths for sliver and roving, 560-yard lengths and pounds for spun yarn, and the mixture of fixed weight and fixed length systems are vigorously denounced. The author proposes and immediately discards as impractical two modifications of the English system, and then announces his solution to be "the adoption of the standard metric system," by which "all such difficulties will be done away with." Mr. Priestman thinks "no apology is needed for its adoption" in the textile industry, because, forsooth, "it is now so universally used by scientists and chemists all over the world." He tells how easy the change will be: "All such difficulties will be done away with. The weights can easily be bought without trouble (sic), and the simplest of all methods could be adopted, if the trade would consent to have the standard of count altered by about 12 per cent.; that is to say, a gram (of 15 1/2 grs.) would replace our 12 1/2 grs. weight, and yarn which we call 60s, with 33,600 yards to the pound, would have in future to be called 67.7s because it would contain 67.7 meters per gram. Roving from which to spin it with a draft of 6, would be called 11.3, which is 67.7 divided by 6, and tops which are now measured as 4 ozs. in 10 yds. would be known as 80s, that is to say there would be 80 meters in a kilogram."

This apparently seems simpler to Mr. Priestman than it does to us. The author touches lightly on the chaos of the transition period, and asserts that "if any master will work out a set of drafts and doublings by the old and new methods, there is small doubt that he would very soon turn reformer," like the author himself. He then adds: "The cumbersome calculations for draft from roving to yarn (just described) are so typical of all other calculations in a drawing that there is no use in wasting time describing a method so involved. All that has to be said on this complicated subject will, therefore, be stated in meters and grams." He adopts a fixed weight system for indicating the sizes of worsted in process, apparently oblivious of the fact that such a method is impractical because frequent tests must be made by a fixed length system at every stage of the worsted process.

Accordingly a very large part of the calculations and formulas in this book are stated in metric weights and measures, incomprehensible to English and American worsted manufacturers and overseers, for whom the work has been written. The resulting mixture of English and metric standards causes a confusion approaching that found in Continental works on textile manufacturing. The Continental writers, however, are justified by the fact that Continental standards are in a state of chaos, but there is no justification whatever for an English writer to introduce that confusion in a book intended for the Anglo-Saxon textile industry, which is highly favored with a simple and uniform system of textile standards. The only effect of such introduction will be to impair the value of the book.

In his English calculations Mr. Priestman has put the worst foot forward, ignoring simple and direct methods, and failing completely to give worsted overseers what they need so much, explanations of the "reason why" for textile calculations.

The book contains chapters on cone drawing, spinning, dry spun yarns, twisting, winding, reeling and warping, concluding with one on defects and remedies. There is much to be found in it of value, both theoretical and practical, although the spirit of the reformer is carried rather too far in dealing with the processes of worsted manufacture. A large part of the contents of this book has already been published in the Textile Manufacturer, of Manchester, Eng., a fact that is not mentioned in the bound volume.

Handbook on Lace Making (Handbuch der Spitzenkunde); by Tina Frauberger, director of the Lace School at Dusseldorf; 263 pages, 5 1/2 by 8; Seeman & Co., Leipzig, Germany. Price $1.75.

This is a technical and historical sketch of lace making, illustrated with numerous designs of typical samples of lace of the different periods. The text is in German.

Business Literature.

The Leighton; Leighton Machine Co., Manchester, N. H.

A catalogue calling attention to the various styles of automatic knitting machines built by the Leighton Machine Co. It contains many illustrations of machines, their parts and the goods produced on them.

Turbine Water Wheels; Risdon-Alcott Turbine Co., Mount Holly, N. J.

This is a new edition of the Risdon-Alcott wheel book, describing the Risdon and Alcott turbines. It acquires additional interest by reason of its being the first edition issued since the merging of the business of T. H. Risdon & Co., and T. C. Alcott & Son, under one management. In addition to the illustrations and descriptive matter the catalogue contains many tables of value to users of water power. Fifteen of the 120 pages are occupied with a list of the users of the Risdon-Alcott turbines and to whom those desiring information are referred.

Knitting Machinery; Stafford & Holt, Little Falls, N. Y.

A catalogue in which the various styles of knitting machinery built by this firm are illustrated and described. They include border machines, plain, Swiss rib, sleevers, design knitting machines, glove finger, facing machines, power parallel bed knitters and nappers.

Goulds Efficient Power Pumps; The Goulds Mfg. Co., Seneca Falls, N. Y.

This booklet has been issued as an advance catalogue and covers only a small part of the Goulds line of power pumps. On page 32 is an illustration of the complete catalogue, a copy of which will be mailed upon application.

Bulletin No. 134, engineering series; B. F. Sturtevant Co., Hyde Park, Mass.

This bulletin is entitled "Steel Pressure Blowers," and relates to high pressure types of fan blowers for foundry and similar uses. It contains a valuable table of fan capacities for various size foundry cupolas.

Steel Split Pulley; Latshaw Pressed Steel & Pulley Co., Pittsburgh, Pa.

An illustrated booklet calling attention to the Latshaw steel split pulleys, which were described in a recent issue of this journal.

"Applications of Electricity."

We have received from the Co-Operative Electrical Development Association, of Cleveland, O., an attractive booklet called "Applications of Electricity," showing its uses for light, heat and power in different lines of business. This is the first time in the electrical trades that a comprehensive table of applications of electricity has ever been prepared. Over 500 distinct applications of current are tabulated.

The Conditions of Fan Blower Design.

The velocity with which air escapes into the atmosphere from a reservoir is dependent upon the pressure maintained therein and upon the density of the air. The presure per unit of area divided by the density per unit of volume gives the head, usually designated as the "head due to the velocity." The velocity produced is that which would result if a body should fall freely through a distance equal to this head. In the case of the flow of water such a head always exists; as, for instance, when a standpipe is employed to produce the requisite pressure. Suppose the head of water to be 50 feet and its weight per cubic foot to be 62.5 pounds, then the pressure per square foot will be 50 by 62.5 = 3,125, and that per square inch 3,125 ÷ 144 = 21.7 pounds. Its theoretical velocity of flow from an orifice at the bottom of the standpipe would be 56.7 feet per second, as determined by the formula for falling bodies, which is $v = \sqrt{2gh}$ in which

v = velocity in feet per second.
g = acceleration due to gravity.
h = head in feet, here 50 feet.

In the case of air, however, an actual homogeneous head never exists, but in its stead we have to deal with an ideal head which can only be determined by dividing the pressure by the density. As the density of air is so much less than that of water it is evident that for a given pressure the head will be far greater in the case of air. But the velocity of discharge is dependent only on the distance fallen which is represented by the head, whether real or ideal. As a consequence, air under a stated pressure escapes at vastly higher velocity than water under the same conditions. Calculated in the same manner the velocity of es caping air under a pressure of 21.7 pounds per square inch is 1,626 feet per second. By the employment of formulae based upon this theory the elaborate basis tables published by the B. F. Sturtevant Co. have been calculated.

From the preceding discussion, it is evident that the pressure created by a given fan varies as the square of its speed. That is, doubling the speed increases the pressure fourfold. The volume of air delivered is, however, practically constant per revolution, and therefore is directly proportional to the speed.

The work done by a fan in moving air is represented by the distance through which the total pressure is exerted in a given time. As ordinarily expressed in foot pounds, the work per second would, therefore, be the product of the velocity of the air in feet per second, the pressure in pounds per square foot, and the effective area in square feet over which the pressure is exerted.

From this it is evident that the work done varies as the cube of the velocity, or as the cube of the revolutions of the fan. That is, eight times the power is required at twice the speed. The reason is evident in the fact that the pressure increases as the square of the velocity, while the velocity itself coincidently increases; hence, the product of these two factors of the power required is indicated by the cube of the velocity.

The actual work which a fan may accomplish

must depend not only on its proportions, but upon the conditions of its operation and the resistances which are to be overcome. Evidently, it is improper to compare fans when operating under such conditions that these resistances cannot be definitely determined. The simplest and most natural condition of operation is that in which the fan is operated without other resistance than that of the case; that is, with open inlet and outlet. For proper comparison of different fans, the areas through which the air is charged should bear some constant relation to the dimensions of the wheels themselves.

It has been determined experimentally that a peripheral discharge fan, if enclosed in a case, has the ability, if driven at a certain speed, to maintain the pressure corresponding to its tip velocity over an effective area which is usually denominated the "square inches of blast." This area is the limit of its capacity to maintain the given pressure. If it be increased the pressure will be reduced, but if decreased the pressure will remain the same. As fan housings are usually constructed, this area is considerably less than that of either the regular inlet or outlet. It, therefore, becomes necessary, in comparing fans upon this basis, to provide either the inlet or the outlet with a special temporary orifice of the requisite area and the proper shape, and make proper correction for the contracted vein. The fan is thus, in a sense, placed in a condition of striction of discharge, which it approaches in practice only in so far as the resistances of pipes, passages and material through which the air must pass have the effect of reducing the free inlet or outlet of the fan.

The square inches of blast, or, as it may be termed, the capacity area of a cased fan, may be approximately expressed by the empirical formula:

Capacity area $= D\ W \div x$.

In which D = diameter of fan wheel in inches.

W = width of fan wheel at circumference, in inches.

x = a constant, dependent upon the type of fan and casing.

The value of x has been very carefully determined by the B. F. Sturtevant Company for different types of fans; but these values must be applied with great discretion, acquired through experience and a thorough knowledge of all the conditions liable to affect the fan in operation.

Would Not Use Any But Albany Grease.

"There is nothing like a trial of 'Albany' grease to make one satisfied that it is an ideal lubricant," said a representative of Adam Cook's Sons. "When it has been used for a number of years one is convinced that this is so."

James P. Hannigan, chief engineer with the Denver & Rio Grande Railroad Company at their Burnham, Col., shops, in writing to Adam Cook's Sons, 313 West Street, New York City, the sole manufacturers of "Albany" grease says:

"I am a great advocate of 'Albany' grease. I have used it for a number of years and I would not use any other kind of grease. I find it eliminates the danger of hot bearings and as long as there is any 'Albany' grease in the cup, it will feed down through and it will also feed through any old cup. We use nothing but 'Albany' grease in our plant."

Warp Sizing.

Sizing warps by the chain system is very expensive if the right kind of size is not used. Mills for colored goods have had good success by using the Sizeoleum and the Soluble Softener, manufactured by the Arabol Mfg. Co., 100 William St., New York. These materials are used with either corn or potato starch. The Sizeoleum is also recommended as a reliable and superior compound on print cloth, warps, sheetings and domestics. No tallow must be used with it.

New Offices.

The Atlas Engine Works of Indianapolis whose Chicago sales offices have for several years been in suites 900-902 Fisher Building, will, upon completion of the new Fisher Building in November, increase their present rather cramped quarters by the addition of several larger offices. Mr. Frank H. Baker, connected with the Atlas for over twenty years, will continue at the head of its Chicago organization.

The Cultivation of Ramie.

In 1900 a syndicate in Bengal made contracts with local planters controlling an area of 3,700 acres.

At first it was difficult to obtain the requisite plants for making plantations; indeed it became necessary to make a nursery on each farm to multiply the rhizomes. The plantations suffered much from termites, which rapidly destroy the young roots, especially the cuttings. Planting the latter during the rainy season is, however, a partial remedy, but the best method of multiplication is by division of the stalks. Portions of rhizomes can be taken from the plants one or two years old without detriment to the plantations. Only light permeable soils give goods results, neither nitrous soil nor alkaline land being suitable for the growing of ramie. In well-cultivated places, where weeds were carefully removed, each plant annually produced from 15 to 30 stalks; whereas in a field where, by way of experiment, the weeds were allowed to grow, there were only three to five stalks per plant; a weeded part of the same field gave 10 to 15 stalks. It is absolutely necessary to keep ramie fields free from weeds.

Ramie being a very exhausting crop, the question of fertilizers deserves very careful study, for without them crops are poor. Ramie requires plenty of water to develop it properly, but the water must not remain too long in the soil, otherwise decay of the roots would be the result. Its cultivation had to be abandoned in two places, where the rainfall did not exceed 35 inches annually. Several samples of ramie fibre were sent by the syndicate to various spinning mills in Europe, where they were regarded as being equal in quality to China grass. It is the intention of the syndicate to degum their fibre themselves, to avoid the cost of transport of the 3 per cent. of gummy substances in it.—French Journal of Tropical Agriculture.

Removal Notice.

The J. L. N. Smythe Co. have been forced by their increasing business to purchase the five-story building at 507 Ludlow St., Philadelphia, where the improved facilities for handling their business enable them to serve their customers even more promptly than heretofore.

Germany's Lead in Chemicals.

The remarkable development of the chemical industry in Germany is attested by the fact that that country produces annually a million tons of sulphuric acid and half a million tons of soda.

As to pharmaceutical products, the quinine alone exported from the Fatherland is valued at about $3,333,000, and antipyrine and antifebrine at an equal amount. The colors, acids, and chemical manures exported are valued at about $166,000,000. "One may then assert without fear of contradiction," said a manufacturer in speaking of the results achieved, "that today Germany furnishes five-sixths of the dyes used in the whole world."

The secret of German success lies in the fact that they have an army of scientific men from which they are now reaping the benefit of years of work and expenditure. At one plant alone no less than 190 chemists work all the year in search of new products. The advantage of combination is also stated by a German chemical manufacturer, who merged his interests with another factory and effected great savings. Thus the two factories do not compete abroad. One has branches at Lyon and Riga, the other at Creil, Moscow, Augsburg, and Milan. One of the factories gave up the production of acids and salts, securing them from the other where they were produced much cheaper.

A competent authority states that the 9,000 factories and 200,000 workmen engaged in the chemical industry of Germany will this year turn out products of which the value will be about $357,000,000, and that the value of chemical exports will probably establish a record. And yet this industry is scarcely thirty years old. In fact, a German manufacturer stated that "thirty years ago England was mistress of the market for salt and alkalies, as well as for coloring matter extracted from coal tar; today Germany is at the head of all the manufacturing nations of the world, not only for dyes but for chemical and pharmaceutical products."—Commercial Intelligence, London.

Saving in Fuel Cost.

The Prather Engineering Co., Rockefeller Building, Cleveland, O., make a specialty of economies in the "steam end" of mills already equipped—new plants as well. They have had fifteen years' experience in stoker, boiler, power, heating, ventilating, and drying engineering. They study the conditions and arrangements of each plant, then suggest improvements and changes that will increase efficiency and reduce cost. They make no charge for inspection and submit no proposition unless they can guarantee results. Textile manufacturers would do well to write them.

Electrical Installments.

The following list of recent sales by the Crocker-Wheeler Co., of Ampere, N. J., shows that the company's customers are not confined to any industrial line. In this list are represented many of the largest manufacturers in the United States. The majority of these machines are to be installed in plants where Crocker-Wheeler apparatus has been tested by actual operation. The following are the names of the customers and ratings for the apparatus recently ordered:

Watervliet Arsenal, nine 25 h. p. motors 230 v. for operating gun lathes.

Gilbert Knitting Co., Little Falls, N. Y., one 300 k. w. a. c. generator 240 volts, 257 r. p. m., and one 13 k. w. d. c. generator 125 v. 900 r. p. m. as exciter.

Eastman Kodak Co., one 300 k. w. d. c. generator 125 v. 100 r. p. m. driven by Allis-Chalmers engine to be installed at their power house at Eastman Park.

Vincent & Linerode, one 150 k. w. d. c. generator 250 v. 550 r. p. m.

Becker Bros., Chicago, Ill., 100 1 1/4 l. motors driving bottle washing machines.

Blackall & Baldwin, N. Y., two 60 k. w. d. c. generators 250 v. 275 r. p. m., driven by Buffalo Forge engine.

Borough of Kietztown, Kietztown, Pa., one 75 k. w. a. c. generator 300 v., 900 r. p. m., driven by Hornsby-Ackroyd gas engine.

Manufacturers' Contracting Co., Wilmington, Dela., one 100 k. w. d. c. generator, 125 v., one 50 k. w. d. c. generator, 125 v., to furnish power for lighting the DuPont Building.

The Textile Finishing Machinery Company's Banquet.

The great success of the banquet given last year by this company at the famous Squantum Club, a few miles from Providence on Narragansett Bay, led the officers of the company to again invite a large number of their friends and customers to enjoy their hospitality at the same club, Sept. 22.

Upon arriving at the clubhouse about noon, the guests were welcomed and an appetizing luncheon was served, after which an informal reception was held, and the guests scattered over the attractive grounds, to meet later in the large dining room. The officers of the company presided at the different tables, Col. Harold J. Gross, president, occupying the centre of the cross table, and Messrs. H. A. Tillinghast, treasurer, E. A. Rusden, general manager, and Frederick I. Dana, sales agent, presiding at the three long tables running the length of the room. The tables were most attractively decorated with flowers, and the banquet was one of the famous fish, clam and lobster repasts for which the Squantum Club is renowned.

After the dinner Col. Gross welcomed the guests in a few well chosen words, and introduced Congressman Capron of Rhode Island, who spoke interestingly. Other speakers were ex-Governor D. Russell Brown, Thos. J. Walsh of the Hamilton Print Works, John P. Farnsworth of the Providence Dyeing & Bleaching Co., and others.

The whole affair was carried out with such a spirit of hospitality and cordiality of welcome that all enjoyed the occasion from start to finish and went away with the best of feelings toward their generous hosts.

The Knickerbocker "Cyclone" Dust Collector.

This is the name of the dust collector manufactured by the Knickerbocker Co., Jackson, Mich. It is constructed along new lines. The vertical whirl is eccentric to the axis of the casing and by means of deflectors is held from pressing against, cutting off, and choking back the incoming air, thus avoiding all back pressure. The casing will last a lifetime as there is no grinding of dust against it. Offering no resistance, it works close on fine dust and the manufacturers are prepared to study closely the requirements of textile manufacturers' special needs.

"Quitshivering" Underwear.

A novelty in high-grade underwear is being introduced by the "Quitshivering" Underwear Company, of 324 Dearborn St., Chicago. It is the invention of Dr. Swantees. It consists in re-enforcing the back, which adds materially to the warmth and protection of the garment for this portion of the body. The back of the garment is double, and a loosely woven intermediate fabric keeps the two members from contact, thereby forming an air space. This underwear is made in shirts and union suits of mercerized and fleece-lined cotton, balbriggan and wool for men, women and children, and is sold under a registered trade-mark. An attractive booklet entitled "Back Talk" describes the garment.

Lombard-Replogle Engineering Company.

Nathaniel Lombard and Mark A. Replogle have perhaps been more prominently identified with the development of water wheel governors than any other hydraulic engineers. These two experts have now joined hands and efforts, and the extensive new works for the Lombard-Replogle Engineering Co., at Akron, O., are now under way, and will be ready for occupancy late in October. The principles employed in the Lombard-Replogle governors are those which are known and tried, and in the new governor the weak points have been eliminated and the best features of both mechanisms embodied in the new type.

The popularity of the new Sturtevant enclosed engine, with forced lubrication and watershed partition, is shown by recent sales, among which may be included the Jeanesville Iron Works Co., Hazelton, Pa.; Mutual Wheel Co., Moline, Ill.; Rand-Avery Supply Co., Boston, Mass.; Wood Worsted Mills, Lawrence, Mass.; W. W. Gleckner & Sons Co., Canton, Pa.; MacArthur Bros. Co, Glen Lyn, Pa.; Thomas & Smith, Chicago, Ill.

Industrial Locations.

Among our new advertisements will be noted that of the industrial department of the Rock Island-Frisco Lines.

The above department has jurisdiction over the lines of the Chicago, Rock Island & Pacific R. R., the St. Louis and San Francisco R. R., and the Chicago & Eastern Illinois R. R., and reaches seventeen states and territories. It necessarily follows, therefore, because of the vast extent of territory reached, and with such varying conditions, that desirable manufacturing locations for all classes of industry can be found along their rails.

The province of the industrial department is to advise the manufacturer regarding the best all-round industrial locations for his particular industry from the standpoint of accessibility to his raw materials, fuel supply, markets for finished product, favorable labor conditions and inducements procurable from local commercial organizations. The Rock Island Frisco industrial department offers its aid and co-operation to all manufacturers and business men seeking new locations, and can furnish particulars regarding the above mentioned manufacturing requirements at cities along its rails.

Hill's Stop Motion for Knitting Machines.

The new stop motion recently invented by D. H. Hill, 2163 North Ninth St., Philadelphia, is meeting with good success. It is intended for spring beard needles on round head machines for making lace work on hosiery, stockinet, etc. Breakage of the thread stops the machine at once. Orders can be filled promptly.

Agents for the Latshaw Pulley.

The Latshaw Pressed Steel and Pulley Company of Pittsburgh, Pa., have recently appointed the following distributing agents: New York City, Henry J. McCoy Co.; Brooklyn, Chas. E. Ring & Co.; Newark, R. Gray, Jr., Inc.

Removal Notice.

The Empire Laundry Machinery Co. have moved their Boston office into new and larger quarters at 73-75 Pearl Street, where they are better prepared than ever to meet the wants of their customers.

Mr. Louis Simpson, the manager of the Montreal Cotton Company, of Valleyfield, P. Q., has recently been elected a member of the executive council of the Canadian Manufacturers' Association and assigned to the important sub-committees having charge of insurance and parliamentary affairs.

Non-Shrinkable Hosiery.

The demand for non-shrinkable woolen knit goods, which has heretofore been confined chiefly to underwear, is now being extended to woolen hosiery. Chas. H. Heyer, 1501 Real Estate Trust Building, Philadelphia, calls attention to the fact that the "Nevershrink" process controlled by him can be used as well for hosiery as for underwear. During the four years since this process was introduced it has been adopted by many manufacturers of both woven and knitted woolens in this country and abroad. It is said that the process affects only the felting and shrinking qualities of the wool, leaving the original elasticity, handle, feel, color and strength unimpaired.

The extent to which it makes wool unshrinkable is well shown by the accompanying illustration of a stocking the upper portion of which was treated with the non-shrinkable process and the lower portion left untreated. The stocking was then subjected to a hard felting with the result as shown. The treated part of the stocking was not affected by the felting; thus the ribs in the fabric are clearly visible while the lower portion has shrunk to less than half its original size This process is of interest to all hosiery manufacturers and especially to those manufacturing infants' goods. The inventor of the process, C. Scott Althouse, has a well-equipped laboratory and is in a position to make practical demonstrations of the effects of the process on any samples submitted.

Stains on Silk.

The causes of reddish and yellowish streaks appearing on dyed silks were first investigated scientifically by Sisley and Gnehm. The following account of the latest work on the subject will be of interest.

The stains have been already recognized as due to the effect of the common salt in the perspiration upon the mineral weighting of the silk, but the exact rationale of that effect remained unknown. It was also shown that if care was taken to prevent the silk from being contaminated with perspiration during weaving, the stains became of much less frequent occurrence.

Meister's experiments led him to investigate a theory previously broached, that the effect of the common salt was due to chlorine being liberated from it by some catalytic action. This chlorine is capable not only of changing the color of the silk, but of destroying the fibroin. Meister was led to study this theory by the fact that the reddish blotches appearing simultaneously on silken fabrics closely resemble those produced by bleaching powder. The question he set himself to solve was what was the body exerting the catalytic action. He is of opinion that copper is the body concerned, and that traces of it in the presence of acid, or in other words traces of copper salts, decompose common salt catalytically, i. e., without themselves undergoing any permanent chemical change.

Silks showing large stains of the kind in question revealed the presence of traces of copper, due to impurity of the weighing solutions, or to the use of copper vessels. Meister also observed that contact with copper coins greatly hastened the formation of the stains, and that salts of iron, manganese, or nickel were without any action, so far as the stains were concerned. The sooner, too, the stains appear, the more copper the silk contains.

It remained to bring into accordance with this theory the striking fact that this effect on silk is specially common in southern Europe. Now, in France and Italy, the workmen carry loose coppers in their pockets, and these coppers are often in contact with perspiring fingers, which then transfer traces of copper to the silk which the men handle.

If, however, we disregard this exceptional method of conveying copper to the silk, the greater warmth of the climate in the south of Europe, which would greatly favor catalytic action, is a sufficient explanation of the greater frequency of the stains in that part of the world.

Since the appearance of Meister's observations, Guiseppe Gianoli, director of the silk-drying institution at Milan, has set himself entirely against Meister's conclusions. He admits that traces of copper are always present, not only in dyed, but in raw silk, but denies the catalytic action altogether. Gianoli treated skeins of unweighted silk with a solution of chloride of copper in 500 times its weight of water, for a month, in light and darkness alternately. Similar skeins, loaded with tin salt, were exposed to the action of the copper solution for fifteen days. No diminution in the strength of the silk was detected in thirty comparisons, with untreated silk. This convinced Gianoli

that the copper compounds were without influence on the change in the color of the silk. His theory tallies, to some extent at least, with that put forward by Georgiewicz and Muller, for he asserts that changes in color and weakening of the fibre always occur when experiments are made with common salt containing traces of iron. He thinks that the sweat stains occur when the weighting of the silk with silicate and phosphate of tin fixes traces of iron upon the fibre. When he loaded silk with stannic chloride, mixed with small quantities of ferric chloride, and kept it in the dark, he found that it became from 14.6 to 15.6 per cent. weaker than silk loaded with tin without any iron.

Thus Meister and Gianoli are exactly opposed. The former makes copper the responsible factor in the result, and considers the presence of iron immaterial. Gianoli maintains the exact reverse. Thus the matter remains. The credit of having discovered the prevention of the stains by means of sulphocyanides belongs to Meister.—Faerber Zeitung.

Finishing Colored Cottons.

The finish is one of the most important parts of the manufacture of colored cottons. It may be fairly said that the finish controls the sale. A well-executed finish often brings new customers, and a bad-looking finish drives away the old ones. In former times, when goods fetched prices which enabled the best yarn to be used, there was no need to procure handle and weight by extraneous means. As things are now, however, it is necessary to make light goods simulate heavier ones, in handle as well as in weight. This, then, is the finisher's task. The following words are intended to show how best to fulfil it when it is a question of the cheapest possible finish.

Epsom salts play an important part in the finishing, not merely of colored cottons, but of linen, half-linen, and especially jute. Now finishers constantly use this salt without due regard to the important fact that for different qualities of goods solutions of different strengths should be used. They treat everything with one and the same solution, usually one of about 10 lbs. of Epsom salts to 6 gals. of water, and the result is waste of magnesia and an inferior finish, with every class of goods, except those which require just that particular strength. A finisher who knows his business, knows that it pays to suit his salt solution to his fabric. For instance, for rather heavy bed-linen of good quality, a magnesia solution of 4° B. is quite strong enough. Zephyrs, brought from the loom, can be given an excellent appearance with magnesium sulphate of 3° to 4° B., without any other addition. Medium quality colored cottons, cotton table-linen, cotton bedclothes finished with a solution of from 10° to 14° B. will have a good handle and appearance, if they are first treated with a solution of 3 lbs. magnesium chloride, 10 lbs. of glycerine, and 300 lbs. of white dextrine, in 500 gallons of water. Thin qualities of these goods can be very cheaply finished with magnesium sulphate of from 18° to 24° B.; but as so strong a solution gives a harsh feel, it must be mixed with castor oil or glycerine. This strong solution is the cheapest of all finishes, but it makes the goods very hard if long stored in a dry place, and flabby if in a damp one. Although an immense quantity of goods is finished with nothing but Epsom salts, it is better to add a little of some softener, such as starch dextrine, syrup, castor oil, or Turkey-red oil. A strong solution will keep very well, and can be diluted to the proper degree for use.

The following example of overdoing Epsom salt finishing may be of interest. A firm was offered an order for 5,000 jute sacks, each to weigh 46 ozs., the usual weight for the size being 36 ozs., but the extra weight not to be charged for. The extra 10 ozs. was, of course, made up with Epsom salts. When delivery was made the purchaser expressed himself perfectly satisfied. The sacks were filled with grain and sent on a month's sea voyage. On arrival, when it was a question of discharging cargo, it was found that the sacks burst as soon as any attempt was made to lift them. The overdose of Epsom salts had made them absorb so much moisture that they had rotted.

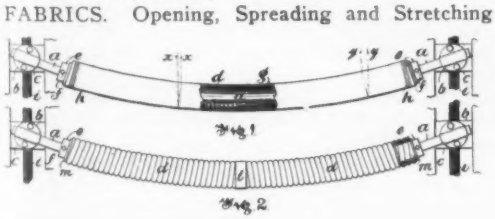
Mangling is an excellent sequel to finishing with Epsom salts, but calendering is even better. The following is an approved recipe for a calender finish: Dissolve 4 lbs. of glycerine, 5 lbs. of magnesium chloride, 40 lbs. of wheat starch, and 20 lbs. of pale dextrine in 60 gallons of water. While this is boiling, dissolve 10 lbs. of Epsom salts in water, dilute to about 10° B., and mix the two liquids. After finishing, calender. The pressure and heat of the cylinders must be regulated according to the judgment of the calenderer. — Die Deutsche Faerber Zeitung.

Tenter drying equipment, built by the B. F. Sturtevant Co., of Boston, Mass., is being installed by the Fall River Bleachery, Fall River, Mass.; Barnaby Mfg. Co., Fall River, Mass.; Lonsdale Company, Lonsdale, R. I.

Recent Textile Patents.

DYEING WOOL BLACK. 830,082. Franz Koenitzer, Zittau, Germany.

FABRICS. Opening, Spreading and Stretching Apparatus. 829,805. James A. Sackville, Manchester, England.



In essence the improved expander consists of a flexible shaft with or without a flexible protective covering and held to an arch formation across the fabric to be treated, the distance between the two ends of the expander being slightly greater than the widest width of fabric. This shaft is composed, preferably, of coiled wire, and the coiling of the wire is either the same from end to end of the shaft or one-half of the shaft is of a right-hand coil and the other half of a left-hand coil, so that the shaft may be used with the protective

covering for delicately-tinted fabrics and without the covering for other fabrics.

FABRICS. Producing Lappet Figures upon Woven. 830,223. William K. Greer, North Adams, Mass., assignor to Arnold Print works, Adams, Mass.

FIBRE CLEANING MACHINE. Textile. 831,407. Carl H. Behnisch, Luckenwalde, Germany.

FIBRE TREATING ENGINE. 829,746. Solomon R. Wagg, Appleton, Wis.

KNOT TYING DEVICE. 829,569. Levi S. Carden, Orange Co., N. C., assignor of one-half to J. W. Gore, Chapel Hill, N. C.

LOOM. 829,474. Mary P. C. Hooper, New York, N. Y.

LOOM LET-OFF MECHANISM. 829,689. Arthur E. Benson, Agricultural College, Miss., assignor to Draper Co., Hopedale, Mass.

LOOM. Needle. 831,322. John C. Brooks, Paterson, N. J.

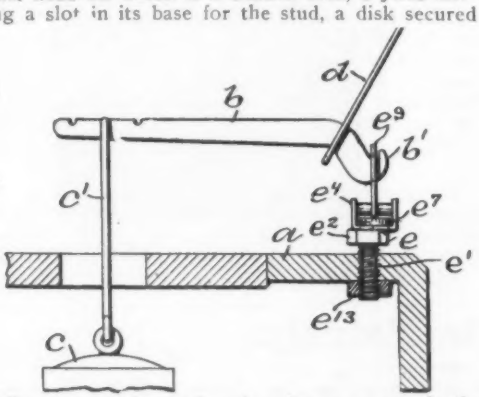
LOOM. Pile Fabric. 831,045. Thomas B. Dornan and Nathaniel M. Shinn, Philadelphia, Pa., assignors to Dornan Bros.

LOOM WARP Stop Motion. 829,479. Albert Mann, Bridgeport, Conn., assignor to Kip Armstrong Co., New York, N. Y.

LOOMS. Automatic Stop Motion Mechanism for Power. 830,561. Jean F. Blumer, Engi, Switzerland.

SPINNING FRAMES. Adjustable Fulcrum for the Weight Levers of. 830,215. Ezra Dixon, Bristol, R. I.

This invention consists in the peculiar and novel construction of an adjustable fulcrum for the drawing-roll weight-levers of spinning-machines, and comprises a stem adapted to screw through the front rail of a spinning-frame and having a polygonal head on which is a central stud, a yoke having a slot in its base for the stud, a disk secured



off centre to the stud and acting as a cam in the yoke, a cross-pin extending through the arms of the yoke, a link pivotally secured to the cross-pin, and a lock-nut on the stem engaging with the front rail of the spinning-frame, whereby a drawing-roll weight is adjusted vertically, a stirrup-strap adjusted forwardly or rearwardly between the drawing-rolls, and the fulcrum locked in its adjusted position.

LOOMS. Filling Feeder for Filling Replenishing. 830,397. Everett S. Wood, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOMS for Weaving Pile Fabrics. Jacquard Mechanism for. 831,144. Richard S. Cookson and Henry Cookson, Philadelphia, Pa.

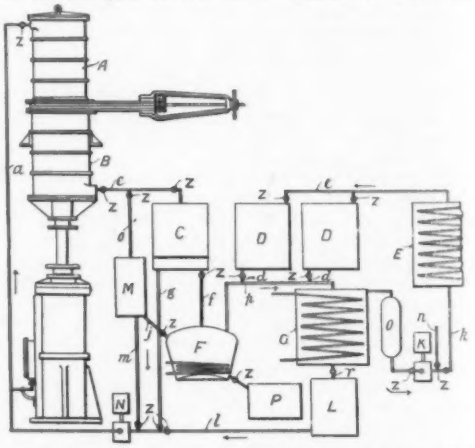
MEASURING DEVICE. 830,211. John T. Crenshaw, Dermott, Ark.

SPINNING AND TWISTING Rings. Ring Holder for. 830,452. George L. Pierce, Manchester, N. H.

TEXTILE GROMET WEB. 830,034. Alfred M. Ziegler, Boston, Mass.

WOOL. Extraction of Grease from. 829,764. Arthur H. Burt, Mosman, and Henshaw Jackson and Charles A. Finch, Sydney, N. S. W.

In this apparatus the wool is placed in a close press-chamber provided with a piston or lifting false bottom operated by a ram which is worked by hydraulic or other power. A body of solvent liquid is introduced into this press-chamber as soon as it has been closed. To insure complete penetration of the solvent into the heart of the bale, inspirating-needles (with button-heads to facilitate insertion and withdrawal) are driven downward into the bales. Complete saturation of the wool in the bale is effected by submitting the same to a number of successive compressions by reciprocating the piston, whereby the solvent is alternately squeezed out of and allowed to resoak the wool. The fat-charged solvent after withdrawal from the



press-chamber is run through a filter in which wool may be used for a filter-bed, and the filtered liquid is thence conveyed to a still, wherein the volatile liquid is driven off to a condenser fitted with an air-pump, and is thence returned to the solvent-tank for reuse. After final pressing in the press-chamber to squeeze out the free liquor, the wool is lifted into a closed drying-box, through which a draft of air is pumped or drawn by vacuum. This air takes up the absorbed solvent and carries it through the condenser in which it is extracted and whence it passes to the solvent-tank.

YARN. 831,108. Henry Ryder, New York, N. Y., assignor to the Ryder Wire & Fibre Mfg. Co., Jersey City, N. J.

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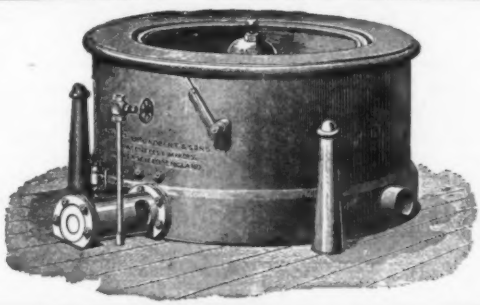

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You know the friction load of a mill, the power to turn belts and shafting alone, is high, from 20-50 per cent. of your total load.

Half of this is from tight belts.

Cling-Surface permits every belt to be run easy and carry fullest loads and turns this half from overcoming friction to doing work.

Besides preserving the belts, saving oil, labor and fuel, and giving steady, even speed at machines.

It is a belt food — not a sticky dressing.

A trial order will prove it. Send for one.

Cling-Surface Co

199-205 Virginia Street Buffalo N Y

Boston: 170 Summer Street
New York: 39 Cortlandt Street
Philadelphia: The Bourse

Power, Lighting, Heating, Ventilating and Drying Complete New Plants Improvements and Extension to Old Plants
Economies in Power Developement, Transmission and Application. Economies in Steam Generation and Utilization

PRATHER ENGINEERING COMPANY

HENRY B. PRATHER, President

ROCKEFELLER BUILDING, CLEVELAND, OHIO

OUR SPECIALTIES

The design of the "Steam End" of Paper, Textile and Knitting Mills and other Factories. ECONOMIES in the "Steam End" of Mills already equipped. Improvement of Old Plants. Coated Paper and Other Drying Lithograph and Printing Establishments—Ventilation and Power Transmission.

We make a study of your conditions and arrangements for Steam Generation, Transmission, and Utilization in Drying, Water Heating, Lighting, etc., also your arrangements for Power Development, Transmission and Application, and suggest improvements and changes which will save you money by increasing your efficiency of operation and reducing the cost of production. **Saving in fuel cost.**

We should like to call and look over your plant. No charge for inspection. No proposition to submit to you unless we can guarantee results.

Our fifteen years experience in stoker, boiler, power, heating, ventilating and drying engineering, is basis of our advice to clients.

Buyers' Index.

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisement. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in these classified lists such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Acetylene Generators.
Wing, L. J., Mfg. Co.

Air Moistening System.
American Moistening Co.
Bell Pure Air & Cooling Co.

Architects and Mill Engineers.
Dean & Main.
Ferguson, John W.

Asphalt Floors.
Simpson Bros. Corporation.

Asphalt Tanks.
Scaife, W. B., & Sons.

Automatic Feeds for Cotton and Wool.
American Drying Machinery Co.
Harwood, Geo. S., & Son.
Hogg, Jas., Machine Co.
Kitson Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schofield, Wm., Co.
Woonsocket Machine & Press Co.

Bale Ties.
DeHaven Manufacturing Co.

Balling Machine.
Diamond Textile Machine Works.
Torrance Mfg. Co.

Bandings.
——See under Yarns.

Baskets.
Lane, W. T., & Bro.
Morris & Co.

Belting.
Gandy Belting Co.
Main Belting Co.
Norwich Belt Mfg. Co.
Shultz Belting Co.
Turner, J. S., Mfg. Co.
——See also Mill Supplies.

Belt Dressing.
Cling Surface Mfg. Co.
Dixon, Jas., Crucible Co.
Shultz Belting Co.
Stephenson Mfg. Co.

Belt Lacing Machines.
Birdsboro Steel Foundry & Machine Co.

Bindings.
——See Tapes and Braids.

Bleaching Kiers.
Allen, Wm., Sons Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Textile Finishing Machinery Co.

Bleaching Materials.
Bosson & Lane.
Roessler & Hasslacher Chemical Co.

Blowers.
Murphy, Harry F., & Co.

Blowers and Blower Systems.
American Blower Co.
Barney Ventilating Fan Works.
Boston Blower Co.
Green Fuel Economizer Co.
Mass. Fan Co.
New York Blower Co.
Philadelphia Drying Machinery Co.
Sterling Pipe & Blower Co.
Sturtevant, B. F., Co.
Schnitzler, Chas. H.

Bobbin Covers.
Kolb, Frank E.

Bobbin Machinery.
Defiance Machine Works.

Bobbins, Spools, Shuttles, Etc.
American Textile Specialty Mchy. Co.
Leigh, Evan A.
Tebbets, E. L., & Co.
Wilson & Co.

Boiler Inspection and Insurance.
——See Steam Boiler Insurance.

Boilers.
——See Steam Boilers.

Boxes, Cloth Boards, Etc.
Pearson, J. T.

Boxes (Paper).
——See Paper Boxes.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Bridges.
Scaife, W. B., & Sons.

Brushers.
——See Napping Machines.

Brushes.
Felton, S. A., & Son Co.
Mason Brush Works.
Parks & Woolson Machine Co.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.
Smith & Furbush Machine Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch Bros., Somerville Machine Wks.
Butterworth, H. W., & Sons Co.
Rice, Barton & Fales Co.
Taunton, New Bedford, Copper Co.
Textile Finishing Mchry. Co.
——See also Dyeing, Bleaching, Machinery, etc.

Canvas Baskets.
Lane, W. T., & Bro.
Morris & Co.

Carbonizing.
Riverdale Woolen Co.

Carbonizing Machinery.
American Drying Machinery Co.
Birch Bros., Somerville Machine Wks.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.

Card Clothing.
Ashworth Bros.
Bowes, L. M., Co.
Leigh, Evan A.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.

Carded Cotton.
Blaisdell, S., Jr., Company.
Indian Orchard Company.
Wonalancet Company.

Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
Entwistle, T. C., Co.
Leigh, Evan A.
Riley, C. E., Company.
Smith & Furbush Machine Co.
Stoddard, Haserick, Richards & Co.

Carders' Tools.
Brown, W. H.

Carpet Machinery.
Altemus, Jacob K.
Curtis & Marble Machine Co.
Parks & Woolson Machine Co.
Philadelphia Textile Machinery Co.
Smith & Furbush Machine Co.

Case and Barrel Trucks.
Clark, The Geo. P., Co.

Castings.
Farrell Foundry and Machine Co.
Schofield, Wm., Co.

Cement Pans.
Scaife, W. B., & Sons.

Chain Blocks and Hoist.
Yale & Towne Mfg. Co.

Chemicals.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.

Chemists.
Little, Arthur D.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Pettes & Randall Co.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Smyth, J. L. N., Paper Co.

Cloth Cutting Machinery.
——See Cutting Machinery.

Cloth Stretchers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Leyland, Thomas, & Co.
Textile Finishing Machinery Co.

Clutches.
American Tool & Machine Co.
Humphrey Machine Co.
Hunter, James, Machine Co.

Color Kettles.
Rice, Barton & Fales Machine & Iron Company.

Comb Aprons.
Turner, J. S., Mfg. Co.

Combs (Wool and Cotton).
Hood, R. H.
Leigh, Evan A.
Lowe, Stephen C.
Philadelphia Textile Machinery Co.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.

Concrete Work and Construction.
Simpson Bros. Corporation.

Conveyors, Pneumatic.
——See Blowers & Blower Systems.

Cop Spindles.
American Textile Specialty Mchy. Co.

Cop Tubes.
American Textile Specialty Mchy. Co.
——See Paper Tubes.

Copper Print Rollers.
Rice, Barton & Fales Machine & Iron Company.
Taunton, New Bedford, Copper Co.

Coppersmiths.
Badger, E. B., & Sons Co.

Copper Work for Dyers.
Butterworth, H. W., & Sons Co.
Textile Finishing Machinery Co.

Corrugated Iron and Steel.
Scaife, W. B., & Sons.

Cotton.
Blaisdell, S., Jr., Co.
Charles, W. B.
Riley, C. E., Company.
Stoddard, Haserick, Richards Co.
Wonalancet Company.

Cotton Machinery.
Altemus, Jacob K.
American Textile Appliances Co.
American Textile Specialty Mchy. Co.
American Drying Machinery Co.

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Cotton Machy—cont.
Ashworth Bros.
Barker, James.
Butterworth, H. W., & Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Curtis & Marble Machine Co.
Diamond Textile Machine Works.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
Entwistle, T. C., Co.
Firth, William, Co.
Hetherington, John, & Sons, Ltd.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kip-Armstrong Co.
Kitson Machine Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Metallic Drawing Roll Co., The.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Providence Machine Co.
Rice, Barton & Fales Co.
Riley, C. E., Company.
Saco & Pettee Machine Shops.
Schofield, Geo. L.
Smith & Furbush Machine Co.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.

Cotton Waste.
Blaisdell, S., Jr., Co.
Charles, W. B.

Cranes.
Yale & Towne Mfg. Co.

Crayons.
Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Cutter for Knit Goods.
Eastman Machine Co.
Langston, Samuel M.

Cutting Machinery.
Eastman Machine Co.

Dextrine.
Stein, Hirsh & Co.

Dobbies.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Stafford, G. W., Mfg. Co.

Drawing Rolls.
Hood, R. H.
Metallic Drawing Roll Co., The.

Dryers.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Boston Blower Co.
Buffalo Forge Co.
Butterworth, H. W., & Sons Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Sargent's, C. G., Sons.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Vacuum Process Co.

Dry Goods Trucks.
Clark, The Geo. P., Co.

Drying Boards.
Bull, William C.
Pearson, J. T.

Dusters.
—See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co.
Knickerbocker Co., The.
Philadelphia Drying Machinery Co.
Sterling Blower & Pipe Mfg. Co.

Dyers, Bleachers and Finishers.
Brophy's, T., Sons.
Davidson, J. F.
Fairhill Bleachery.
Fawell, Arthur.
Firth & Foster Co.
Greenwood, R., & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Lorimer's, The Wm. H. & Sons Co.
Pawtucket Dyeing & Bleaching Co.
Peerless Co.
Providence Mills Mfg. Co.
Rowland, Samuel.

Dyeing, Drying, Bleaching and Finishing Machinery.
Alton Machine Co.
Allen, William, Sons Co.
American Blower Co.
American Drying Machinery Co.
American Dyeing Machine Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Beaumont's Limited.
Birch, Arthur, Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Butterworth, H. W., & Sons Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Gessner, David.
Heathcote, John, & Son.
Hopkins Machine Works.
Hunt, Rodney, Machine Company.
Hunter, James, Machine Co.
Kenyon, D. R., & Son.
Klauder-Weldon Dyeing Machine Co.
Klipstein, A., & Co.
Leigh, Evan A.
Leyland, Thos., & Co.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co
Philadelphia Textile Machinery Co.
Rice, Barton & Fales Co.
Smith, Drum & Co.
Sirocco Engineering Co.
Sturtevant, B. F., Co. (Drying).
Textile Finishing Machinery Co.
Vacuum Process Co.
Whiteley, William, & Sons, Ltd.

Dye House Cans.
Hill, James, Mfg. Co.

Dye House Floors.
Simpson Bros. Corporation.

Dye House Trucks.
Clark, The Geo. P., Co.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dye Tubs.
—See Tanks, Tubs and Vats.

Dyestuffs and Chemicals.
American Dyewood Co.
Atteaux, F. E., & Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Continental Color & Chemical Co.
Kalle & Co.
Ford, J. B., Co.
Fortner, L. B.
Geisenheimer & Co.
Johnson, Chas. A., & Co.
Klipstein, A., & Co.
Leyland, Thos., & Co.
Metz, H. A., & Co.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.
Sykes, Walter F., & Co.
Thayer, Ed. M.
West Indies Chemical Works, Ltd.

Dynamos.
—See Electric Lighting.

Edgings.
—See Tapes, Braids and Edgings.

Electrical Construction.
Crocker-Wheeler Co.
General Electric Co.
Murphy, Harry F., & Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Cloth Cutter.
Eastman Machine Co.

Electric Fans.
American Blower Co.
Crocker-Wheeler Co.
General Electric Co.
Mass. Fan Co.
Murphy, Harry F., & Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sterling Blower & Pipe Mfg. Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.
Wing, L. J., Mfg. Co.

Electric Lamps.
Sturtevant, B. F., Company.

Electric Lighting.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Hoists.
Yale & Towne Mfg. Co.

Electric Motors.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.
Wing, L. J., Mfg. Co.

Elevators.
Morse, Williams & Co.
Salem Elevator Works.

Embroidery Machines for Hosiery and Knit Goods.
Walther, Otto.

Employees' Time Recorders.
Pettes & Randall Co.

Engine Stops.
Consolidated Engine Stop Co.

Engineers' Supplies.
Moulton, P. A.

Engravers.
Smith Bros.

Exhaust Heads.
Sterling Blower & Pipe Mfg. Co.
Sturtevant, B. F., Co.

Fans—Exhaust and Ventilating.
—See Ventilating Apparatus.

Feed Water Heaters.
Green Fuel Economizer Co.
Scaife, W. B., & Sons.

Feed Water Pumps.
Goulds Mfg. Co.
Scaife, W. B., & Sons.

Feed Water Purifiers.
Philadelphia Water Purification Co.
Scaife, W. B., & Sons.
The Hungerford Filter Corp.

Feeds.
—See Automatic Feeds.

Felt Hardeners.
Farrell Foundry and Machine Co.

Felting Machinery.
Farrell Foundry and Machine Co.

Filters.
American Water Softener Co.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Scaife, W. B., & Sons.
The Hungerford Filter Corp.
United Water Improvement Co.

Finishing Machinery.
—See Dyeing, Drying, Bleaching and Finishing.

Fire Brick.
Borgner, Cyrus, Co.

Fire Extinguishers.
Badger, E. B., & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Insurance.
Home Insurance Co.

Fire Proof Doors and Windows.
Badger, E. B., & Sons Co.

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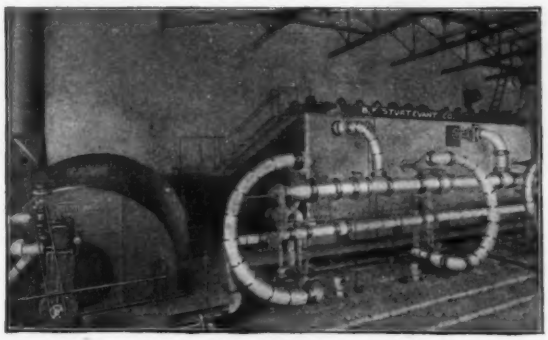
The Sturtevant Economizer and the Sturtevant Mechanical Draft Apparatus

are vital factors in the economical production of steam in power plants.



Patent System of Staggered Pipes in Economizer with metal-to-metal joints

Boiler capacity increased 20 to 40 per cent.

B. F. Sturtevant Co., Boston, Mass.

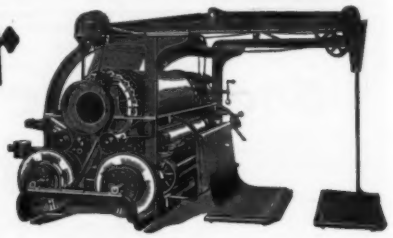
General Office and Works, Hyde Park, Mass.

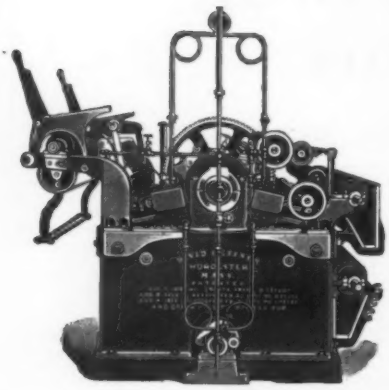
New York Philadelphia Chicago Cincinati London

Designers and Builders of Heating, Ventilating, Drying and Mechanical Draft Apparatus; Fans, Blowers and Exhausters; Rotary Blowers and Exhausters; Steam Engines, Electric Motors and Generating Sets; Pneumatic Separators, Fuel Economizers; Forges, Exhaust Heads, Steam Traps, Etc. 553

David Gessner

Worcester, Mass.

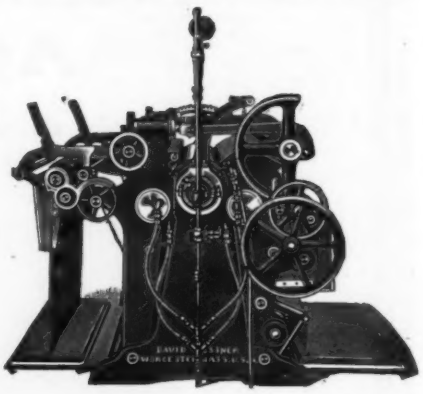




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Fire Pumps.
—See Pumps.

Flax, Tow, Hemp and Jute Machinery.
Fairbairn-Lawson-Combes-Barbour, Ltd.

Fluted Rolls.
Diamond Textile Machine Works.
Hood, R. H.
Leigh, Evan A.
Riley, C. E., Company.
Thurston, A. G., & Son.

Flyers.
Bodden, Wm., & Son, Ltd.
Hopkins Machine Works.
Leigh, Evan A.

Forges.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Forwarders.
Salvator Transfer, Inc.

Friction Clutches.
—See Clutches.

Friction Cones.
Evans, G. Frank.

Fuel Economizers.
Green Fuel Economizer Co.
Sturtevant, B. F., Co.

Fulling Mills for Woolen Goods.
Hunt, Rodney, Machine Co.
Hopkins Machine Works.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.

Garnetts.
Leigh, Evan A.
Smith & Furbush Machine Co.

Gas Blowers and Exhausters.
Sturtevant, B. F., Co.

Gas Engines.
Jones, Lewis.

Gassing Machines.
Stubbs, Joseph.

Gauges.
Crosby Steam Gage & Valve Co.
Walworth Manufacturing Co.

Gears.
Farrell Foundry and Machine Co.
New Process Raw Hide Co.

Gear Cutting.
Farrell Foundry and Machine Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Crocker-Wheeler Co.
Sturtevant, B. F., Co.

Grate Bars.
Tupper, W. W., & Co.

Grease.
Cook's, Adam, Son.

Gut Cords and Strings.
Wentworth, M. W.

Heating.
—See Ventilating.

Heddles.
Steel Heddle Mfg. Co.
Stoddard, Haserick, Richards & Co.

Hoisting Apparatus.
Economy Engineering Co.
Larrabee, Jno. E.
Yale & Towne Mfg. Co.

Hosiery Boards.
Pearson, J. T.

Hosiery Labels.
Beck, Charles, Paper Co.
Kaumagraph Company.

Humidifying Apparatus.
American Moistening Co.
Bell Pure Air & Cooling Co.

Hydraulic Rams.
Power Specialty Co.

Hydro Extractors.
American Tool & Machine Co.
Broadbent, Thomas, & Sons.
Hunt, Rodney, Machine Company.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.

Insulating and Braiding Silks.
Sauquoit Silk Mfg. Co.

Insurance, Fire and for Loss of Profits.
Home Insurance Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Jacquards.
Halton's Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger-Aaron Mfg. Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
Craw, J. W., Laundry Machinery Co.
Eastman Machine Co.
Hunt, Rodney, Machine Company.
Langston, Samuel M.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Boss Knitting Machine Co.
Brinton, H., & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Grosser Knitting Machine Co.
Hemphill Mfg. Co.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Kinsey, Walter.

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CROMPTON-THAYER LOOM COMPANY

—— MANUFACTURERS OF ——

Fancy Looms

For Weaving Worsted and Woolen, Fancy Cottons and Silk Fabrics.

DOBBIES, BOX MOTIONS and SUPPLIES.

WORKS AND OFFICES:

677 Cambridge Street, - Worcester, Mass.

ALEXANDER & GARSED, Southern Agents.

Knitting Mach.—cont.
Koch, Edward W.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
National Automatic Knitter Co.
Nye & Tredick Co.
Paxton & O'Neill.
Scott & Williams.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walter & Co.
Walther, Otto.
Wildman Mfg. Co.

Knitting Needles and Supplies.
Breedon's, Wm., Son.
Brinton, H., & Co.
Continental Latch Needle Company.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Excelsior Needle Co.
Grosser Knitting Machine Co.
Ives, Loyal T.
Jarrard Needle Company.
Kolb, Frank E.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Treat, Orion.
Wardwell Needle Co.

Labeling Machines.
Beck, Chas., Paper Co., Ltd.

Lamps, Incandescent.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Leather.
Bowes, L. M., Co.

Loom Clutches.
Natl. Brake & Clutch Co.

Loom Pickers.
Garland Mfg. Co.

Loom Repairs and Parts.
Glaser Mfg. Co.

Looms.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Draper Company.
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Hepworth, John W., & Co.
Leighton Machine Co.

Lubricators.
Cook's, Adam, Son.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.

Lumpers.
Diamond Textile Machine Works.
Gerry, George, & Son.
Schofield, Wm., Co.

Machinery Dealers.
Jefferson, Ed., & Bro.
Kinsey, Walter.
Lamb, J. K., Textile Mach. Co.
Schofield, Geo. L.
Stead, Arthur.
Taylor, James.

Machinists' Tools.
Whitin, The D. E., Co.

Mails.
Walder, J.

Measuring and Folding Machines.
Curtis & Marble Machine Co.
Elliott & Hall.
Parks & Woolson Machine Co.

Mechanical Draft.
American Blower Co.
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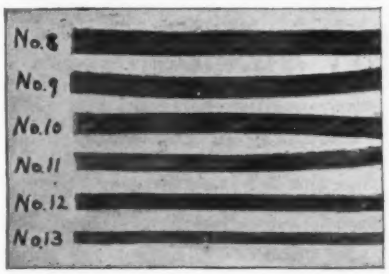

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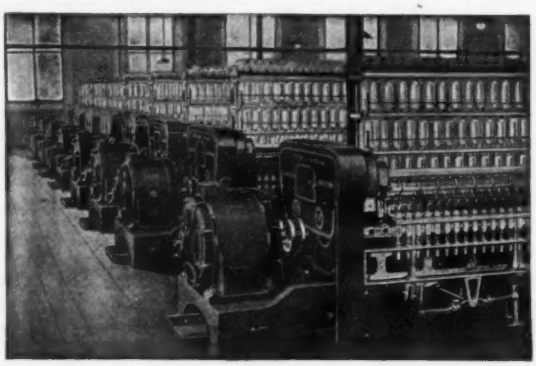

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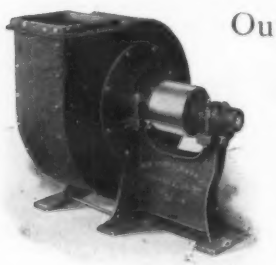

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4.30 p. m. **Daily for Troy, Albany, Binghampton, Elmira, Cincinnati, Rotterdam, Syracuse, Rochester, Buffalo, Cleveland and Chicago.** Pullman Sleeping car Boston to Chicago via Nickel Plate daily, and to Chicago and St. Louis on Sundays only via West Shore and Wabash Roads. Dining car Boston to Rotterdam Jct.

6.19 p. m. **Daily, except Sundays, for Rotterdam, Utica, Syracuse, Rochester, Buffalo, Detroit, Chicago, St. Louis and Kansas City.** Pullman Sleeping car Boston to Chicago and St. Louis. Dining car Boston to Greenfield.

VIA THE SOUTHERN DIVISION.

10 00 a. m. **Daily for Newport, Montreal, Detroit, Chicago, St. Paul and Minneapolis.** Pullman Sleeping car Boston to Montreal, St. Paul and Minneapolis. Tourist car Boston to Chicago via C. P. and Wabash Tuesdays only. Cafe car Boston to Montreal via C. P. Ry. Tourist car to Vancouver via C. P. Ry., Mondays.

11.30 a. m. **Daily for Montreal, Toronto, Detroit and Chicago.** Pullman Sleeping car Boston to Chicago. Tourist car Boston to Chicago on Mondays and Wednesdays via C. V. and G. T. Cafe Parlor car Boston to Montreal via C. V. and G. T. Ry.

7.30 p. m. **Daily for Montreal, Toronto, Detroit, and Chicago.** Pullman Sleeping car Boston to Montreal and Montreal to Chicago.

8.30 p. m. **Daily for Newport, Montreal, Detroit and Chicago.** Pullman Sleeping car Boston to Montreal daily, also Montreal to Chicago except Sundays. Pullman Sleeping car Boston to Sherbrooke via Plymouth and Q. C. Ry., except Saturdays.

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16 pins per inch.

2— 2 Spindle Gills 9 x 14 Bobbin,
½" Pitch of Screw,
12 Fallers up and 6 down,
15 Pins per inch,
⅞ Spindle.

3— 2 Spindle Gill Boxes
14 x 9 Bobbin,
3/8" Pitch of screw,
12 Fallers up and 6 down,
16 Pins per inch.

1— 2 Spindle Gill Box
14 x 9 Bobbin,
12 Fallers up and 6 down.

1— 2 Spindle Gill Box
14 x 9 Bobbin,
7/16" Pitch of screw,
12 Fallers up and 6 down.

1— 2 Spindle Gill Box
14 x 9 Bobbin,
5/8" Pitch of screw,
12 Fallers up and 6 down,
Without Fallers.

1— 2 Spindle Gill Box
12 x 8 Bobbins,
3/8" Pitch of screw,
17 Pins per inch.

2— 4 Spindle Drawing Boxes
4" Front Roll, 10¼" Pitch,
12 x 7 Bobbin.

3— 6 Spindle Drawing Boxes
4" Front Roll, 9¼" Pitch,
10 x 6 Bobbin.

2—12 Spindle Drawing Boxes
6" Front Roll, 5/8" Spindles,
10 x 5 Bobbin.

1—12 Spindle Drawing Box
4" Front Rolls, 7⅛" Pitch,
5/8" Spindles, 4 x 8 Bobbin.

1— 8 Spindle Drawing Box
6¼" Pitch, 4" Front Rolls,
8 x 4 Bobbin.

3—24 Spindle Roving Frames
4" Front Rolls,
6 x 3 Bobbin.

2—144 Spinning Frames
3½" Pitch, By J. & S. Smith.

5—168 Spinning Frames
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Without Spindles.

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200 Spindles, 3¼ Pitch,
2¼" Ring, 5" Traverse,
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1-7/8
With plain Spindles.

3— Collins Twisters as above with Stop Motion.

1— Double Ball Gill Box
3/8" Pitch of Screw,
14 Fallers up and 4 down,
Double Back Rolls.

1— Burr Picker 42" wide

1— Woonsocket Card Feed 45" wide.

1— Harwood Feed 37" wide.

1—6 Head Mixing Gill.

3— Noble Combs.

Some of this machinery is equal to new and most of it is by Prince Smith & Sons.

All the above Machinery will be put in first class order throughout.

Trouble in the Card Room?

I HAVE had a great deal of experience in straightening out troubles in wool card rooms. I believe I have worked in more wool card rooms than any other man in this country, and it has given me an unusual opportunity for noting all sorts of difficulties and the best way of overcoming them. Sometimes an outsider will quickly detect a point which a man always on the spot may overlook. I charge $3.50 a day and my expenses for expert service. Sometimes it is not necessary to visit the mills, as I can tell what the trouble is by correspondence, in which case my fee would be very reasonable.

Clothing Cards a Specialty.

SAM DRIVER, Care Textile World Record, 299 Devonshire St., Boston.

Booklets, Pamphlets and Circular Letters forcibly written for manufacturers and others.

In addition, I furnish a CONTINUOUS CORRESPONDENCE SERVICE, which covers a field peculiarly its own, and which no one can afford to neglect. Through its use you can get and keep in close and constant touch with those you wish to reach by sending out of forcibly written matter from time to time, at a small cost. Will make special rates for trial. Correspondence solicited. Reproduction work furnished when desired.

Charles F. DeGrauw
346 Broadway, New York City.

Overseer of Carding or superintendent in a shoddy mill, carder and spinner in a small woolen mill. Position wanted by a man, 38 years of age, Scotch-American. Worked on all kinds of stock, cotton and wool shoddy mixes. Familiar with all kinds of carding machinery. Could take a position at once. 3738, Textile World Record, Boston, Mass.

Overseer of Knitting. Position wanted by a man, 27 years of age, single, American. Worked on fleeces, fancies, balbriggan and open or mesh work, gauges from 12 to 32. Familiar with the Tompkins knitting machines, Universal and Foster camless cone winders, Huse's bobbin winders. Will not work for less than $3.50 per day. First class recommendations. 3746, Textile World Record, Boston, Mass.

Superintendent of Knitting or satinet mill. Position wanted by a man 45 years of age, married. Has worked on knit and staple goods of all kinds, and is familiar with garnetts, cards and jacks of any make. Good references. 3527, Textile World Record, Boston, Mass.

Foreman Looper. American, 31 years of age, with experience as fixer on rib frames, body and sleeves, hosiery and looper. Worked on misses', boys' and infants' ribs, women's and children's underwear. Accustomed to all machinery used in this work. 3408, Textile World Record.

Overseer of Beaming or quilling. Will go anywhere. Has worked on white and colored cotton goods. First-class references. Age 45, married. 1162, Textile World Record.

Wanted. We are continually having calls for first class loom fixers, also dresser tenders. Loom fixers' wages, $15.00 per week, some over. Dresser Tenders from $2.25 to $2.50 per day. If interested, write to the Overseers' Bureau, care Textile World Record, Boston, Mass.

Just Patented, a new Stop-Motion

For Spring Beard Needles on Round Heads for making Lace Work on Hosiery, Stockinette, Astrakan Cloth, etc.

Breakage of Thread compels Machine to stop instantly.

Machines can be seen at work by addressing

D. H. Hill, 2163 North 9th St., Philadelphia, Pa.

You Save Enough Insurance to Pay for the Equipment.

So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.

Pettes & Randall Co., 150 Nassau St., New York

WATCHMAN'S CLOCK, LATEST IMPROVED

Portable and Electric.
Controls Night Watchman.
Allowance made for old clocks.

T. NANZ & CO., 127 Duane St., N. Y.

Wanted. First class Assistant Designer on Woolens, who has thorough knowledge of weaving; chance for promotion to Superintendent to right party. Address "Chance," care Textile World Record, Boston, Mass.

Bookkeeper or Traveling Salesman would invest some money in a paying proposition. 54 years of age, married, American. 3472, Textile World Record, Boston.

Overseer of Dressing, Spooling, Winding, Twisting and Drawing In. Position wanted by a man 33 years of age, married, German. Has worked on fancy worsteds, fancy cassimeres, cheviots and piece dyes. Is familiar with Davis & Furber and Cleveland machinery. First-class references. 3627, Textile World Record, Boston, Mass.

Overseer of Dressing, Spooling, Slashing, Beaming, Drawing In and Quilling. Position wanted by a man 42 years of age, married, Canadian. Has worked on denims, ticking, sheeting, shirtings, flannelettes, ginghams, dress goods, etc. Is familiar with all kinds of machinery. Good references. 3115, Textile World Record, Boston, Mass.

Overseer of Cloth Room. Position wanted by a man, 26 years of age, American, married. Worked on sheetings, drills, ducks, lawns, lenos, shorn, spot goods, shirtings and satinets. Familiar with the Parkes & Woolson woolen shears, Curtiss & Marble and Lowell cotton shears, Lowell & Dinsmore sewing machines, Curtiss & Marble folders and loop cutters. First class recommendations. 3740, Textile World Record, Boston, Mass.

Overseer of Napping, or second hand position. Position wanted by a man, 34 years of age, English, married. Worked on all kinds of cotton goods, twills, swansdowns, moles, cambrics, lambskins, flannelettes, shirtings and cotton blankets. Familiar with all kinds of double and single napping machines, felter and flat finished machinery, hard cutting and clothing of same. Good recommendations. 3742, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man, 28 years of age, single, American. Has worked on American Egyptian cotton as fine as 20 hank. Understands all kinds of carding and combing machinery. First class reference. 3747, Textile World Record, Boston, Mass.

Overseer of Dressing or superintendent in a colored or white mill. Position wanted by a man, 45 years of age, American, married. Has worked on all kinds of colored and white work. First class recommendations. 1187, Textile World Record, Boston, Mass.

SITUATIONS WANTED.

The following advertisements are a portion of those of superintendents and overseers, of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Mr. C. T. Donlevy, a practical mill overseer and superintendent, who has a wide acquaintance with mill men, is now a member of the Textile World Record staff, and gives special attention to this department. He would be pleased to hear from any of his friends who may be interested.

COTTON SUPERINTENDENTS.

Superintendent and Designer in a woolen mill. Position wanted by a man, 33 years of age, American, married. Has worked on broad cloths, plaidbacks, fancy dress goods, union cassimeres, satinets, thibets and shirtings. Familiar with all kinds of machinery. First class recommendations. 3745, Textile World Record, Boston, Mass.

Superintendent and Designer in a woolen mill. Position wanted by a man, 30 years of age, single, Scotch. Has worked on all kinds of men's wear, wool and worsted, plain and fancy, also dress goods. Familiar with all kinds of machinery. Will go any place for a good position. First class references. 3749, Textile World Record, Boston, Mass.

Superintendent or Designer in a small woolen mill, or assistant superintendent or designer in a large mill or bookkeeper. Position wanted by a man, 46 years of age, married, Scotch. Worked on men's wear, ladies' dress goods and cloakings. Has worked in all departments in a woolen mill, has taken a course in designing and is familiar with Crompton & Knowles looms and Davis & Furber mules. Will not go West, South or Canada. Good references. 3750, Textile World Record, Boston, Mass.

Manager or superintendent of a worsted mill. Position wanted by a man 33 years of age, married and English. Is experienced on all grades of wool and hair, and is familiar with all makes of worsted machinery. First-class references. 3596, Textile World Record, Boston, Mass.

Superintendent, assistant superintendent or assistant designer. Position wanted by a man 28 years of age, married, and American. Is experienced on all classes of woolen goods, and is familiar with Crompton & Knowles looms. Good references. 3591, Textile World Record, Boston, Mass.

Superintendent or Assistant Superintendent and Designer. Position wanted by a man 34 years of age, married, English. Is experienced on worsted coatings, woolen cassimeres, amazons, venetians, dress goods, kerseys and beavers. Is familiar with all kinds of woolen machinery. Good references. 3629, Textile World Record, Boston, Mass.

Superintendent or Assistant Superintendent. Position wanted by a man 29 years of age, Scotch. Is experienced on woolens and worsteds, men's and ladies' wear, flannels, homespuns and coverts. Is familiar with Crompton & Knowles looms, Davis & Furber and Johnson & Bassett mules, James Hunter and Smith garnet machines. First-class references. 3615, Textile World Record, Boston, Mass.

Superintendent or Manager of Woolen Mill. Position wanted by a man 47 years of age, married, Scotch. Is experienced on worsteds, fancy cassimeres, homespuns, meltons, thibets, kerseys, overcoatings, cheviots and dress goods. Is familiar with all kinds of woolen machinery. Good references. 3619, Textile World Record, Boston, Mass.

Superintendent or Designer. Position wanted by a man 34 years of age, experienced on worsted suitings, dress goods, cotton worsteds, cassimeres, overcoatings and coverts. Practical in all departments of woolen mills. First-class references. 3076, Textile World Record, Boston, Mass.

Manager, superintendent or designer. Age 30; English; married. Experienced in England and in this country. Mohairs, all classes of worsted suitings, plain and fancy dress goods. 3184, Textile World Record.

Superintendent or Designer. American, 37 years of age, married, wants a position in United States. Worked on light and heavy weight woolen and worsted goods, fancy and plain, wool and worsted piece dyes, also pebble worsteds. Been superintendent 6 years and designer 8. 3353, Textile World Record, Boston.

Superintendent or superintendent and designer. 45 years of age, with experience on fine fancy worsteds and piece dyes, fancy and piece dye cheviots, fancy woolens and worsteds, also mercerized piece dyes. Understands silk manufacture also. 3382, Textile World Record, Boston.

WOOLEN SUPERINTENDENTS.

Superintendent of a bleachery or print works or assistant superintendent. Position wanted by a man, 38 years of age, an American, married. Worked on all kinds of cotton piece goods. Familiar with all kinds of machinery used in handling these goods. Now employed. First class recommendations. 3724, Textile World Record, Boston, Mass.

Superintendent of a cotton mill. Position wanted by a man, 42 years of age, American, married. Has worked on a general line of colored goods, sheetings, prints and shirtings. Familiar with all kinds of cotton machinery. Has held a position as superintendent in some of the leading mills. Could be employed at short notice. 3726, Textile World Record, Boston, Mass.

Superintendent and Designer wants position as manager. Experienced designer and practical man for the tie-up of looms for weaving ribbons, silk, upholstery and cotton goods, plain and jacquard cloths. 20 years' experience as manager and understands a mill in all its branches. Knows the coloring for stripes and figured upholstery, cotton, silk and ribbon novelties a special. 3423, Textile World Record, Boston.

Cotton Superintendent or assistant superintendent. Worked on linen and union towels and crashes. Father now taking full charge of the business, so he is not needed. Worked on Crompton & Knowles and other machinery used in toweling manufacture. Age 28; first-class reference. 1867, Textile World Record.

Agent or Superintendent, cotton or woolen mill. 53 years of age, American. Worked on men's wear, overcoatings, dress goods, plain cotton goods and fancy shirtings, most all kinds of woolen and cotton machinery. 3457, Textile World Record, Boston.

Superintendent of Bleaching and finishing works. Has experience on Nottingham, Irish point, bobbinet and renaissance curtains a specialty. Also Swiss dots, organdies, lace handkerchiefs, embroideries, etc. Thoroughly understands aetying, carbonizing and dyeing. A practical man, no experidesigner. Worked on shirting and all kinds of menter. 3443, Textile World Record, Boston.

Superintendent or Assistant Superintendent. Position wanted by a man 31 years of age, married, American. Is experienced on men's half hose, ladies' work and rib top, boys' and misses' ribbed and infants' cassimere silk tip hose. Is familiar with Acme, Hemphill, Scott & Williams, Brinton, Wildman, Nye & Tredick, Campbell & Clute and other knitting machinery. Good references. 3643, Textile World Record, Boston, Mass.

Superintendent of Print Works, or Color Mixer, Printer, Bleacher and Mercerizer. Position wanted by a man 31 years of age, married, Scotch. Has worked on organdie lawns, shirtings, sateens, skirtings, etc. Is familiar with all kinds of drying starch manglers, etc. Rusden and Butterworth tenter machines, and all kinds of machinery used in print works. Good references. 3641, Textile World Record, Boston, Mass.

Superintendent or Carder and Spinner. Position wanted by a man 46 years of age, married, American. Is experienced on all kinds of regular white goods and grain bags, and is familiar with cotton and cotton waste stock. Is familiar with Kitson & Atherton pickers, Biddeford and English frames, revolving roller and top flat cards, Biddeford, Whitin and Lowell. Good references. 3624, Textile World Record, Boston, Mass.

Superintendent of cotton or woolen yarn mill or shoddy plant. Position wanted by a man 50 years of age, who has had a wide experience in the manufacture of yarns. Understands all makes of cotton and woolen machinery, also held position as superintendent in large knitting mills, and is familiar with the American makes of knitting machines. First-class recommendations. 3249, Textile World Record, Boston, Mass.

WOOLEN CARDERS.

Overseer of Carding and spinning. Position wanted by a man, 22 years of age, single. Understands all kinds of American carding and spinning machinery. Has worked on hosiery yarns and all kinds of woolen goods. Good references. 3723, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 34 years of age and married. Has worked on outing flannels, suitings, cassimeres, overcoatings, crashes, meltons, skirtings, kerseys, doeskins, broadcloths, coverts, cheviots and thibets. Is familiar with Davis & Furber, Cleveland, English cards and garnett machines. Good references. 3513, Textile World Record, Boston, Mass.

Boss Carder and Spinner. Worked on all kinds of woolen and cotton and shoddy mixes; also knitting yarn. Familiar with Davis & Furber cards and mules, Johnson and Bassett, Lombard and Cleveland cards and mules. First-class recommendations; 36 years of age; American. 3302, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 34 years of age, married and American. Is experienced on all wool, cotton, cotton and shoddy mixes, knickerbockers, and fancy goods. Is familiar with Davis & Furber, Cleveland, and Lowell Machine Shop carding machinery. Good references. 3565, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Position wanted by a man 47 years of age, married. Worked on woolens and knit goods, both fine and coarse, and all makes of cards. Good reference from mills where he has been employed. 3535, Textile World Record, Boston, Mass.

Overseer of carding and spinning. Position wanted by a man 41 years of age. Has worked on all kinds of woolens, cottons and shoddy mixes. Is familiar with Davis & Furber cards and mules, Cleveland, and any make of cards. Good references. 3598, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Position wanted by a man 56 years of age; married; American. Is experienced on all kinds of stock and is familiar with any make of carding machinery. Good references. 3608, Textile World Record, Boston, Mass.

Woolen Boss Carder. Worked on all classes of unions, cassimeres, beavers. Familiar with all classes of stock. Will not go West. Age 35; married; first-class references. 3174, Textile World Record.

Overseer of Carding in Knitting Mill. American, 36 years of age; accustomed to knit underwear, both cotton and wool; experience on Davis and Furber and Smith cards. Was 5 years second hand in one mill and for the past 6 years has been overseer. 3391, Textile World Record, Boston.

Overseer of Woolen Carding. American, 30 years of age, married; worked on nearly all classes of woolen goods and all machinery used in this work. Prefers West or Middle West. 3170, Textile World Record, Boston.

Overseer of Woolen or worsted carding. Would accept a position as superintendent of a felt mill. Understand the business in every detail. Worked on all kinds of stock and all makes of cards. First class reference. Will go any place for a good position. 45 years of age, American, married. 3470, Textile World Record, Boston.

Overseer of Carding in woolen mill. Position wanted by a man 46 years of age, married, English. Worked on all kind of woolen goods, cotton and shoddy mixes on English and American carding machinery. Good reference from mills where employed. 3469, Textile World Record, Boston.

Overseer of Carding. Position wanted by a man 31 years of age, married, American. Has worked on all wool, cotton and shoddy mixes. Is familiar with Davis & Furber and Furbush carding machinery. Good references. 3626, Textile World Record, Boston, Mass.

Overseer of Carding, Charge of Shoddy Mill, or Felt Carder. Position wanted by a man 54 years of age, married, American. Has worked on all kinds of woolen shoddy and cotton mixes and is familiar with all makes of carding machinery. Good references. 3630, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 36 years of age, married, American. Has worked on wool, cotton and shoddy mix goods, and is familiar with all kinds of woolen cards. First-class references. 3618, Textile World Record, Boston, Mass.

WOOLEN SPINNERS.

Overseer of Spinning. Position wanted by a man 36 years of age, married, English. Has worked on all kinds of wool, cotton and shoddy mixes, and is familiar with English mules, Johnson & Bassett mules and jacks. Good references. 3622, Textile World Record, Boston, Mass.

Overseer of Spinning. Position wanted by a man 49 years of age, married. Has worked on all wool, shoddy mixes, second spinning, double and twist, yarns, from 3/4 run to 12 run. Is familiar with Davis & Furber spinning machinery. First-class references. 3633, Textile World Record, Boston, Mass.

Overseer of Spinning. Position wanted by a man 48 years of age, English. Has worked on all classes of woolen goods, and is familiar with Johnson & Bassett, Davis & Furber and Platt spinning machinery. Good references. 3522, Textile World Record, Boston, Mass.

Overseer of Spinning, twisting, spooling and reeling. Position wanted by a man 28 years of age, married and American. Has worked on army and navy goods, fine and heavy woolen and merino yarns, fine worsteds, and low stock shoddy and cotton mixes. Is familiar with Davis & Furber, James Smith, Whiteley, English Bridesburgh, and Platt mules. Would prefer a position near Philadelphia. Good references. 3517, Textile World Record, Boston, Mass.

Overseer of Spinning. Position wanted by a man 30 years of age, married and American. Has worked on cotton, wool, shoddy and all grades of mixes from 7/8 run to 9. Is familiar with almost every make of spinning machinery. Good references. 3538, Textile World Record, Boston, Mass.

Overseer of Spinning. Position wanted by a man 36 years of age. Has worked on all kinds of woolen goods and is familiar with Davis & Furber mules. First class references. 3549, Textile World Record, Boston, Mass.

Boss Carder and Spinner in a Woolen Mill. Familiar with all grades of woolen and mixed goods. Familiar with all makes of American carding and spinning machinery. Will not go West or South; 40 years of age; first-class recommendations; American. 3294, Textile World Record, Boston, Mass.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

Overseer of Wool Spinning. 39 years of age, with 15 years' experience as overseer on flannels, cassimeres, cheviots, kerseys and cotton mixes. Also on all machinery used in his work. Wants position in the East. 3434, Textile World Record.

Overseer of drawing and spinning. Position wanted by a man, English, 37 years of age, married. Worked on superfine and fine merinos, demi lustres, mohair, etc. Familiar with Prince, Smith, Hall & Stells, J. B. Farrars and Lowell Machine Shop machinery. Good references. 3478, Textile World Record, Boston.

Boss Spinner in woolen mill. Worked on all kinds of woolen, cotton and shoddy mixed goods. Familiar with Johnson & Bassett. Would prefer Furbush mules. First-class recommendations; age 29; American. 3287, Textile World Record.

Overseer of Carding and spinning. Position wanted by a man 40 years of age, American. Has worked on all kinds of stock, cotton, wool and shoddy, and all numbers of yarn from 7/8 to 8 run. Is familiar with Davis & Furber, Johnson & Bassett, Lombard, and Cleveland carding and spinning machinery. Good references. 3577, Textile World Record, Boston, Mass.

Overseer of Carding and spinning. Position wanted by a man 40 years of age, married. Is experienced on all kinds of stock and all numbers of yarn. Is familiar with Davis & Furber, Johnson & Bassett, Furbush, and Bridesburgh carding and spinning machinery. Good references. 3580, Textile World Record, Boston, Mass.

Overseer of Carding and spinning. Position wanted by a man 36 years of age, married and American. Has worked on cassimeres, flannels, overcoatings, knickerbockers, blankets and carpet yarns. Is familiar with American and English cards and Davis & Furber and English mules. Good references. 3539, Textile World Record, Boston, Mass.

COTTON CARDERS.

Second Hand in cotton card room. American, 30 years of age, with a number of years' experience in card room. Has worked in large mills in Fall River and New Bedford and worked on prints, fine and coarse yarns, English and American machinery. Prefers a position in the East. Good references. 3341, Textile World Record.

Overseer of Carding and Frame Spinning. Worked on all kinds of stock, both high and low. 30 years of age; first-class recommendations. 1759, Textile World Record.

Overseer of Cotton Carding or assistant superintendent. Worked on all kinds of cotton, including cotton waste, Sea Island and down to sweepings. Familiar with all kinds of carding machinery; first-class recommendations; 29 years of age; married. 3323, Textile World Record.

Overseer of Carding. American; 26 years of age; worked in all positions in card room up to overseer. Understands nearly all makes of English and American machinery and has worked on white goods, both fine and coarse. 3346, Textile World Record.

Card Grinder, 38 years of age; English; with experience in good mills. Worked on print cloth and on all makes of English cards. Will go anywhere for good position. Good references. 3426, Textile World Record.

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

Overseer of Carding. Position wanted by a man 54 years of age, married. Has worked on shirtings and sheetings from 2 to 10 hank roving. Is familiar with all makes of modern carding machinery. Good references. 3561, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 40 years of age, married. Has worked on all kinds of cotton goods and is familiar with all kinds of cotton carding machinery. Good references. 3541, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 35 years of age, married. Is experienced on carded and combed cotton, Peeler, Egyptian, Sea Island, both for yarns and cloth, in coarse or fine numbers. Is familiar with English and American cards and speeders, and American pickers. Good references. 3558, Textile World Record, Boston, Mass.

Overseer of Cotton Carding. Position is wanted by a man 38 years of age, married, English. Worked on a variety of cotton goods and on American and English machinery. Good references. Could take a position in one week's notice. 3547, Textile World Record, Boston, Mass.

Overseer of Cotton Carding. Position wanted by a man 49 years of age, married, French American. Worked on coarse and fine cotton goods and all numbers on all makes of machinery. Good references. Will not go South. 3551, Textile World Record, Boston, Mass.

Overseer of Cotton Carding. Worked on plain and fancy, coarse and fine white goods. Wants only Rhode Island or Connecticut. 47 years of age; married. First-class references. 1884, Textile World Record.

Overseer of Cotton Carding. 40 years of age; married; worked on yarns, sheetings, ginghams, in some of the best mills in this country and good references from mills where employed. 3450, Textile World Record.

Overseer of Carding Department. Age 38; English; married. Plain and fancy goods; both combed and carded, Cotton Sea Island, Peruvian, Egyptian, Peeler, etc. Good references. 3196, Textile World Record.

Overseer Cotton Carding or Spinning desires position. Age 47; American; married. Is familiar with all the modern makes of English and American machinery, revolving top flat cards, single and double carding. 2073, Textile World Record.

Secondhand in Card Room, or Charge of Combs. Position wanted by a man 30 years of age, married, English. Has worked on all grades of American and Egyptian cotton and is familiar with all kinds of speeders, Whitin, Dobson & Barlow cards, combs and drawing frames. Good references. 3671, Textile World Record, Boston, Mass.

Overseer of Combing. Position wanted by a man 22 years of age, American. Has worked on all classes of medium and fine yarns, and is familiar with Asa Lee's and Whitin combs. Good references. 3664, Textile World Record, Boston, Mass.

Overseer of Carding. Has held all positions in picker and card rooms. White and colored goods, 8s to 40s. 3070, Textile World Record.

COTTON SPINNERS.

Overseer of ring spinning, spooling and warping. Position wanted by a man 32 years of age, American. Has worked on denims, plaids, awnings, checks, lawns, sheetings, lenos, shirtings, etc. Is familiar with Mason, Whitin, Lowell, Davis & Furber and Fales & Jenks, spinning machinery. Good references. 3604, Textile World Record, Boston, Mass.

Overseer of Spinning, Spooling, Warping. Position wanted by a man 35 years of age, married, American. Has worked on all kinds of cotton yarns, from 20s to 120s. Is familiar with Fales & Jenks, Mason, Whitin, Saco & Pettee, and Lowell spinning machinery. Good references. 1788, Textile World Record, Boston, Mass.

Overseer of Spinning, Spooling, Warping. Position is wanted by a man 35 years of age, married, American. Has made yarns from 8s to 80s on all makes of spinning machinery. Worked on all makes of spooling, warping, twisting machines. 3468, Textile World Record, Boston.

Overseer of Ring Spinning. Position wanted by a man 26 years of age. Has worked on all kinds and numbers of cotton yarn. Is familiar with Whitin spinning machinery. Good references. 3684, Textile World Record, Boston, Mass.

Overseer of Ring Spinning, spooling and warping. Worked on all classes of goods, hosiery yarns, long and short staples from 8s up. Familiar with Sayles & Jenks, Mason, Lowell, Whiting and Saco & Pettee machinery. First-class references. 28 years of age; married. 3308, Textile World Record.

Overseer Ring Spinning, spooling and warping wishes a position. A married man, with good experience. Worked on sheetings, shirtings, jeans, grain bags. 3152, Textile World Record.

Overseer of Mule and Ring Spinning. Position wanted by a man, English, 35 years of age and married. Worked on hosiery, coarse and medium and fine yarns, more accustomed to medium yarns. Is graduate of a textile school and familiar with Parr & Platt mules, Mason mules and Whitin and Lowell frames. 3483, Textile World Record, Boston.

Overseer of Frame or mule spinning and twisting. Position wanted by a man 46 years of age, married and American. Has worked on sateens, twills, 30 warp, 46 filling yarns from 3s to 150s. Is familiar with all makes of spinning and twisting machinery. Good references. 3532, Textile World Record, Boston, Mass.

Overseer of Ring Spinning, spooling and warping. Position wanted by a man 38 years of age, married and American. Has worked on plain and fancy goods, all numbers of yarn, combed and carded. Is familiar with Mason, Whitin, and Fales & Jenks machines. Good references. 3018, Textile World Record, Boston, Mass.

Overseer Spinning, spooling and warping. American, 34 years of age, with experience on sheetings, shirtings, sateens, twills, awnings, ducks, denims, etc., and all machinery used in this work. Capable of taking a superintendent's position, but would accept good overseer's position. 3374, Textile World Record.

Overseer of Cotton Spinning, 25 years of age, with experience on heavy and medium white and colored goods, 5s to 60s. Denims, chambrays, awnings, napped goods, fine shirtings, etc. Worked on all American ring spinning frames, Draper spoolers and warpers, also twisters and on ball or chain and beam. 3420, Textile World Record.

Overseer of Cotton Spinning. Englishman with experience on mule and frame spinning; worked on 3 1/2 to 200s filling, and on all kinds of novelty yarns, white or colored; accustomed to all machinery used in this work; wants a position in the States. 3437, Textile World Record.

Overseer of Cotton Spinning or superintendent of a small mill. Would accept any reasonable offer. Worked on all grades of cotton goods and cotton yarns from 20s to 100s. Familiar with all kinds of cotton machinery. 44 years of age; American; married. 1882, Textile World Record.

Overseer of Mule Spinning. Position wanted by a man 28 years of age, English. Has worked on white and colored yarns from 6s up to 93s, Egyptian and Sea Island cotton. Is familiar with Platts, Asa Lees, Taylor & Langs, Dobson & Barlow, Curtis, Biddeford, Parr, and Mason mules. Good references. 3542, Textile World Record, Boston, Mass.

COTTON WEAVERS.

Overseer of Cotton Weaving. Position wanted by a man, 27 years of age, American, married, with experience on prints, cambrics, sateens, drills, corded goods, etc. Worked on Draper, Whitin, Lowell, Mason and Colvin looms. Prefers a position in the East. 3430, Textile World Record, Boston, Mass.

Overseer of Cotton Weaving. Position wanted by a man, 39 years of age, American, married. Worked on all kinds of cotton goods, plain and fancy. On English, Colvin, Mason, Whitin and Draper looms. Could take a position at two weeks' notice. First class recommendations. 3735, Textile World Record, Boston, Mass.

Superintendent or Boss Weaver in a woolen mill. Worked on all kinds of woolen and worsted goods; familiar with all kinds of woolen machinery; 43 years of age; married; English. 3292, Textile World Record, Boston, Mass.

Overseer of weaving, drawing in and twisting. Position wanted by a man 44 years of age; married; English. Has worked on plain twills, sateens, fancy lenos, Jacquard loppetts, also plush goods. Is familiar with Mason, Draper, Whitin and Crompton & Knowles looms. Good references. 3590, Textile World Record, Boston, Mass.

Overseer of silk and cotton weaving. Position wanted by a man 46 years of age; married; German. Has worked on fancy lenos, taffetas, satins, hard silk and skein dyed. Is familiar with all makes of looms. Good references. 3613, Textile World Record, Boston, Mass.

Overseer of Weaving. Worked on ginghams, sheetings, shirtings and dress goods. Familiar with Crompton & Knowles and Mason looms. First-class recommendations, 23 years of age. 3299, Textile World Record, Boston, Mass.

Overseer of Weaving or Cloth Room. Worked on heavy ducks, denims, suitings, checks, lenos, fancy lenos and lappets, from 2s to 200s yarn carded and combed. Familiar with Lowell, Whiting, Crompton & Knowles, Mason and Draper looms. First-class recommendations, 34 years of age, married, American. 3309, Textile World Record, Boston, Mass.

Overseer of Weaving. Position wanted by a man 28 years of age and married. Worked on fancy shirtings, lenos, silk dress goods, lappets and plain goods. Familiar with Jacquard machines, Mason, Crompton & Knowles and Stafford dobbies, looms. 3474, Textile World Record, Boston.

Overseer Cotton Weaving. Position wanted by a man who has had experience on plain goods, twills, sateens on all counts from 18s up. 34 years of age; married. Could take a position at short notice. Worked on Mason, Colvin, Whitin, Lowell and Northrop looms. 3455, Textile World Record.

Overseer of Cotton Weaving. American, 45 years of age, with 26 years' experience on plain sheetings, sateens and twills as fixer, second hand and overseer. Able and temperate. Wants position in the East. 3439, Textile World Record.

Foreman of Weaving. Worked on ribbons of all descriptions, silk and cotton labels, tapes and lenos. Will not go to Canada or Maine. Age 34, American. First-class references. 3183, Textile World Record.

Overseer of Weaving, superintendent of weaving or designing. Worked on all kinds of cotton dress goods, also suitings. Familiar with all kinds of American and English looms and machinery. Age 41; English; widower. First-class references. 2068, Textile World Record.

Overseer of Weaving or loom fixing. Worked on cotton, woolen, silk. Used to Crompton & Knowles looms, both box and plan, Lewiston looms, Mason, Colvin, Whiting, Patterson, etc. Age 43; Scotch; married. 3216, Textile World Record.

Overseer of Weaving or designer. Lawns, sheetings, twills, sateens, quilts, bedford cords, lappets. A young man; unmarried. Good experience and first-class recommendation. 3068, Textile World Record.

Superintendent or boss weaver in a cotton or woolen mill. Worked on sheetings, shirtings, ginghams, plaids, checks, cottonades and figured jeans. Familiar with all kinds of machinery; 45 years of age; first-class references. 1806, Textile World Record.

Loom Fixer on Silk, or Foreman in small shop. 38 years of age; married. Wants position in Philadelphia if possible. Been fixing 16 years and on plain and fancy goods. Understands English plain looms and Knowles box looms. 3386, Textile World Record.

WOOLEN WEAVERS.

Overseer of Weaving or assistant designer in a woolen mill. Position wanted by a man, 37 years of age, married, American. Worked on beavers, kerseys, chinchillas, meltons, frieze, worsted and worsted cloakings. First class recommendations. 3737, Textile World Record, Boston, Mass.

Overseer of Weaving. Position wanted by a man, 39 years of age, American, married. Could take a position at short notice. Familiar with all kinds of woolen and worsted goods. First class recommendations. 3727, Textile World Record, Boston, Mass.

Overseer of Weaving. Position wanted by a man, 40 years of age, married, an American. Worked on cheviots, ladies' dress goods, janes and woolen goods of all kinds. Familiar with the Crompton & Knowles looms. Good recommendations. 3725, Textile World Record, Boston, Mass.

Overseer of Weaving. Position wanted by a man 40 years of age, married, English. Has worked on all kinds of woolen and worsted goods. Is familiar with Knowles and Crompton looms. Good references. 3647, Textile World Record, Boston, Mass.

Overseer of Weaving. Position wanted by a man 45 years of age, and married. Has worked on all classes of woolen and worsted goods, such as kerseys, beavers, flannels, fancy cassimeres, fancy worsteds, men's wear, serges, dress goods, etc. Is familiar with Crompton & Knowles looms. First-class references. 3546, Textile World Record.

Overseer of Woolen Weaving. Position wanted by a man 38 years of age, married, American. Worked on fancy woolens and worsteds, fancy tweeds, shawls, flannels and beavers. Good references. 3550, Textile World Record.

Overseer of Weaving. Position wanted by a man 32 years of age and married. Has worked on woolen dress goods, suitings, cotton worsteds, worsted dress goods, kerseys, beavers and blankets. Is familiar with Crompton, Knowles, Furbush, Davis & Furber looms and dobby looms. Has first-class recommendations. 3544, Textile World Record.

Overseer of Weaving. Position wanted by a man 28 years of age, single and Scotch. Has worked on wool and worsted, and union goods, blankets, shirtings, rugs, etc. Is familiar with Crompton & Knowles, also English looms and dobbies. Has good references. 3507, Textile World Record.

Overseer of Weaving. Position wanted by an American, 39 years of age, single. Worked on worsted, plain and fancy cassimeres, dress goods and overcoatings. Is familiar with Crompton & Knowles and Crompton & Thayer looms. 3473, Textile World Record.

Overseer of Weaving. Position wanted by a man, American, 45 years of age and married. Has worked on dress goods, cloakings, flannels, meltons and unions. Is familiar with Crompton & Knowles and Stafford looms. Good references. 3494, Textile World Record, Boston.

Overseer of Weaving. Worked on worsteds, cassimeres, dress goods, and all kinds of woolen goods. Crompton & Knowles looms. First-class references; American; 45 years of age. 3262, Textile World Record.

Overseer of Weaving. Position wanted by a man 38 years of age, American, married. Has worked on woolen and worsted goods and is familiar with Crompton & Knowles looms. Good references. 3498, Textile World Record.

Overseer of Woolen Weaving. 18 years' experience as overseer. Worked on cassimeres, cloakings, chinchillas, cheviots, beavers, meltons, shawls, also worsteds and on Crompton and Knowles looms, wants a position in the East. Good references. 3422, Textile World Record, Boston.

Overseer of Weaving, or weaver and designer. American, 40 years of age, with experience on all grades men's wear and all makes of woolen looms, pickers, spoolers, twisters, etc., wants a position in the East. 3379, Textile World Record.

Boss Weaver in Woolen Mill, or would accept a good loom fixing position. Worked on satinets, cotton and woolen warp goods, sheetings, shirtings and ducks. Also worked on cotton and woolen jute bagging. 45 years of age. 1806, Textile World Record.

Overseer of Woolen Weaving. American, 40 years of age, married, with experience on worsteds, cassimeres, kerseys, dress goods, satinets, etc., wants a position in the East. Has worked on all machinery used in this work. 3412, Textile World Record.

DYERS.

Overseer of Dyeing. Position wanted by a man 40 years of age, married and an American. Has worked on wool and cotton yarns, and piece dyeing. Is familiar with all kinds of dyeing machinery. Has good references. 3506, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man 27 years of age, English. Has worked on worsted and cotton yarns, cotton hosiery, slubbing, cotton warp and piece dyes. Is familiar with Klauder-Weldon and Delehanty dyeing machines. First-class recommendations. 3534, Textile World Record, Boston, Mass.

Overseer Dyeing, Expert Bleacher. American, 35 years of age, worked on cotton and fine woolen yarns, tapes, underwear and linen. Understands nearly all makes of dyehouse machinery. 2065, Textile World Record, Boston.

Overseer of Dyeing. 26 years of age, with experience as overseer. Worked on fancy cassimeres, thibets, satinets, piece goods and raw stock. Wants a position in the East. Would accept good second-hand position. 3336, Textile World Record, Boston.

Overseer of Dyeing. .33 years of age; married; 11 years' experience as overseer. Worked on worsted, union and knit goods, cotton hosiery, loose stock, also dress goods, beavers, serges, etc. Prefers New England. 3340, Textile World Record.

Boss Dyer and Bleacher. Familiar with turkey red dyeing, indigo and cotton yarns and all kinds of dye stuffs. 29 years of age. Scotch. 3145, Textile World Record.

Boss Bleacher. Bags, shades, lawns, mercerized. Hollands, book cloth and table cloth. Prefers New York, New Jersey or Pennsylvania. 3083, Textile World Record.

Practical Dyer is open for engagement and would like to correspond with responsible firm. Has a thorough knowledge of the dyeing of hosiery and underwear, cotton, wool and mixed goods in all percentages, balbriggans, etc. In last position 9 1/2 years. 1513, Textile World Record.

Chemist or Boss Dyer on hosiery or cotton goods. Worked on hosiery, underwear, yarns and cotton raw stock. Familiar with all kinds of dyeing machinery; 27 years of age; American; first-class recommendations. 3289, Textile World Record, Boston, Mass.

Overseer of Dyeing. Englishman, with 20 years' experience as overseer in this country, wants position in the East. Accustomed to dress goods, plain and mixed, piece dyes on worsted, fine broadcloth, kersey cloaking, etc. 3343, Textile World Record, Boston.

Overseer of Dyeing. Position wanted by a man 41 years of age. Married, English, with good references from mills where employed. Worked on all wool, cotton and shoddy worsted piece dyes, slubbing, raw stock and indigo vats. 3479, Textile World Record, Boston.

Overseer of Dyeing. Position wanted by a man, Swedish, 35 years of age, married. Has worked on worsted yarns, raw stock, wool and all kinds of cotton raw stock, piece dyeing, union dyeing and warp dyeing and sizing. 3491, Textile World Record, Boston.

Assistant Superintendent or second hand in a large dye house. Position wanted by a man, 27 years of age, single, American. Worked on cheviots, cassimeres, flannels, covert cloth, overcoatings, some cotton and fancy worsteds. Familiar with all kinds of machinery used in a textile mill. Good recommendations. 3743, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man, 35 years of age, married, English. Has had a thorough training in chemistry. Has worked on wool, cotton and shoddy raw stock, piece dyes, yarn bleaching, scouring, extracting, etc. Familiar with alizarine colors, all kinds of dyeing and scouring machinery. First class recommendations. 3736, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man 30 years of age, American. Has worked on worsted and cotton yarns, mercerized piece dyes, fast shades on raw stock and slubbing. Is familiar with all kinds of dyeing machinery. Good references. 3592, Textile World Record, Boston, Mass.

Boss Dyer. Worked on wool worsteds, cotton raw stock and piece dyes. 47 years of age; married: Italian. Take a position at short notice. 3441, Textile World Record.

FINISHERS

Overseer of Finishing and Dyeing. Position wanted by a man 37 years of age, married. Worked on all kind of worsted and woolen goods, men's wear, dress goods, rain cloth and union goods. Good references. 3569, Textile World Record.

Starcher or Assistant Finisher. Position wanted by a man 30 years of age, married and American. Has worked on satinets, dress goods, linings, silesias, pocketings, ducks, shoe goods, trunk cloth, percalines, canvass, etc. Is familiar with all kinds of starching, hot-press and calendering machinery. Good references. 3511, Textile World Record, Boston, Mass.

Second Hand in dry-room or shear-tender. Position wanted by a man 29 years of age and American. Has worked on kerseys, meltons, cheviots, piece dyes, thibets, coverts, dress goods, face goods, overcoatings, worsteds and woolens. Is familiar with Parks & Woolson shears and Miller presses. Good references. 3510, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by a man 40 years of age, married and American. Has worked on all kinds of wool and worsted and cotton mix goods and cotton worsteds. Is familiar with all kinds of machinery used in wet and dry finishing. Good references. 3536, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by a man 39 years of age, married and American. Has worked on kerseys, beavers, cassimeres, worsted dress goods, cheviots, piece dyes and cotton mix goods. Is familiar with all kinds of American and German finishing machinery. Good references. 3533, Textile World Record, Boston, Mass.

Overseer Wet and Dry Finishing. American, 30 years of age, with experience on nearly all grades of woolen mixes, cotton warp goods, steam face goods, piece dye, etc. Six years as overseer, with good references. 3376, Textile World Record.

Overseer of Finishing. Familiar with all kinds of woolen and worsted men's wear, dress goods, including high lustre on ladies' and men's face finished goods, overcoatings, meltons and unions. 39 years of age; American; first-class references. 3271, Textile World Record.

Overseer of Finishing. Worked on all kinds of men's wear, fancies and piece dyed woolens and worsteds, dress goods of every description and face goods. First-class references; 36 years of age; Scotch. 3273, Textile World Record, Boston, Mass.

Overseer of Finishing of piece goods or assistant superintendent, or chemist; familiar with all kinds of cotton goods, lawns, flannelettes and wash goods. Worked on all kinds of machinery, including Granger and Butterworth machines; first-class recommendations; 31 years of age; married. 3317, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by a man, 49 years of age, American, married. Has worked on satinets, unions, shirtings, and all classes of goods made with cotton warp. First class references. 3744, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by a man, 38 years of age, married, American. Has worked on kerseys, friezes, thibets and all kinds of woolen and worsted goods. Familiar with all kinds of machinery. First class reference. 3748, Textile World Record, Boston, Mass.

Overseer of Wet Finishing and gigging. Position wanted by a man 48 years of age, American. Has been employed in one of the largest mills in the N. E. States as overseer of wet finishing and gigging. First class references. 3722, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by a man, 34 years of age, English, married. Worked on beavers, meltons, friezes, cassimeres, satinettes, chinchillas, cotton fancy and piece dyed worsteds. First class recommendation. 3729, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by a man, 45 years of age, married, American. Has worked on all kinds of woolen goods, including beavers, kerseys, meltons, etc., also all kinds of fancy and piece dye worsteds. Has been employed in leading mills in the N. E. States. Will not go to Canada or Pennsylvania. Good recommendations. 3739, Textile World Record, Boston, Mass.

DESIGNERS.

Assistant Designer. Position wanted by a man 21 years of age, American. Is a graduate of the Lowell Textile School, and has worked on all kinds of cotton goods, woolen and worsted dress goods and men's wear. First-class references. 3649, Textile World Record, Boston, Mass.

Designer and Assistant Superintendent. Position wanted by a man 32 years of age, married, Scotch. Is experienced on all grades of woolens and worsteds, both men's and ladies' wear, cheviots, and homespuns a specialty. Is familiar with Crompton & Knowles looms. Good references. 3666, Textile World Record, Boston, Mass.

Designer and Assistant Superintendent. Position wanted by a man 43 years of age, married, English. Is experienced on all classes of goods from fine worsteds to the lowest woolens for men's wear. Fancy and plain cloakings and dress goods, linings, mercerized goods, unions. Is familiar with Crompton & Knowles looms and Johnson & Bassett and Davis & Furber mules. Good references. 3655, Textile World Record, Boston, Mass.

Assistant Superintendent and Assistant Designer. Position wanted by a man 27 years of age, German. Has worked on fancy cassimeres, overcoatings and dress goods. Is familiar with Crompton & Knowles looms. Good references. 3681, Textile World Record, Boston, Mass.

Agent, Superintendent or Designeer in a woolen mill. Could accept a position in four weeks' notice. Familiar with all kinds of woolen goods, including cheviots, cassimeres, flannels, blankets and mackinaws. 28 years of age; American; first-class references from mills where he has been employed. 3280, Textile World Record.

Assistant Superintendent and Designer. Position wanted by a man 32 years of age, married. Is experienced on men's wear, dress goods, cotton worsteds, woolens, linen towels, madras, flannels, etc. Is familiar with Knowles, Crompton, Clipper, Bridesburg dobby cam looms, dressing, spooling, twisting and warping frames. Good references. 3665, Textile World Record, Boston, Mass.

Designer. Position wanted by a man 34 years of age, married, American. Is experienced on dress and tie silks, cotton and silk goods, novelty fabrics and ribbons, woolen and worsted Jacquard work. Is familiar with Crompton & Knowles, Stafford, Schaum & Uhlinges Jacquards. First-class recommendations. 3635, Textile World Record, Boston, Mass.

Designer and Assistant Superintendent. Position wanted by a man 36 years of age, married. Is experienced on cheviots, meltons, kerseys, dress goods, overcoatings, cassimeres, piece dyes, etc. Is familiar with all kinds of machinery used in these goods. Good references. 3631, Textile World Record, Boston, Mass.

Designer on Webbing, or Asst. Supt. in a cloth mill. Position wanted by a man 23 years of age, American. Is experienced on worsted and cotton goods, but mostly in the webbing business. Is a graduate of the Lowell Textile School and is familiar with Crompton & Knowles looms. Good references. 3578, Textile World Record.

Designer or Asst. Supt. Position wanted by a man 34 years of age. Has worked on fancy worsteds, cheviots, overcoatings, and cotton worsteds. Is familiar with Crompton & Knowles looms. Good references. 3518, Textile World Record.

Designer. Position wanted by an American, 28 years of age and married. Worked on checks, plaids, madrases, cheviots, woolen and worsted suitings, fancy ginghams, gauzes, lenos, spot effects and novelties, etc. Is familiar with Crompton & Knowles plain and dobby looms, Mason plain and dobby looms and Kilburn & Lincoln plain looms. Good references. 3482, Textile World Record, Boston.

Designer and Assistant Superintendent. Position wanted by a man 31 years of age, married, Scotch. Is experienced on cassimeres, cheviots, coverts, outing rain coatings, piece dyes and has had some experience on worsteds. Is familiar with Crompton & Knowles looms. Good references. 3625, Textile World Record, Boston, Mass.

Designer. Worked on ladies' dress goods, shirtings and flannels and some jacquard designing; first-class recommendations; 33 years of age; married. 3285, Textile World Record.

Designer or superintendent. Age 37; English; married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Wants $30 to $40 per week. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

KNITTERS.

Superintendent, or Overseer of Knitting in a Hosiery Mill. Position wanted by a man 33 years of age, single, has worked on ladies', men's and misses' wool, worsted and cotton seamless hosiery on Wildman, Scott & Williams, Ruth and Brinton ribbers, Hepworth and Beatley loopers, Acme and Geor. D. Mayo automatic foot machine. Good recommendations. 3698, Textile World Record.

Superintendent or foreman of knitting. Position wanted by a man 25 years of age, American. Is experienced on men's, women's and children's gloves and mitts, fine-stitch toques and hosiery on worsted and saxony Creelman machines. Is familiar with the Lamb machine, more especially on gloves and mitts, the Brinton full automatic machine and the Creelman hosiery machine. Will be open for engagement about Sept. 1st. First-class references. 3611, Textile World Record, Boston, Mass.

Superintendent or overseer of knitting. Position wanted by a man 41 years of age; married; American. Has worked on all classes of underwear and hosiery on spring and latch needle. Is familiar with all makes of knitting machinery. Good references. 1874, Textile World Record, Boston, Mass.

Superintendent or Overseer in Hosiery Mill. All classes seamless hosiery. Understands Branson and Automatic ribbed toe machines; also Pepper and 3/4 Automatic Excelsior. Age 49; good references. 1441, Textile World Record.

Foreman of Knitting Room. Age 29; American, unmarried. Fleece of all kinds and gauges. Balbriggan from 20 to 30 gauge. Flat work wool goods. Tompkin Bros. and Campbell & Clute machines. Will not go South. 3204, Textile World Record.

Manager of a Hosiery Mill. Familiar with woolen, worsted and cotton and full-fashioned seamless hosiery. 45 years old, American. First-class references. 1657, Textile World Record, Boston, Mass.

Superintendent of Hosiery Mill. American, 40 years of age, with a number of years' experience as overseer, would accept a good position anywhere in United States. Worked on cotton and lisle hosiery, fashioned, seamless, lace, embroidered and plain, and on nearly all makes seamless machines and all others used in an up-to-date mill. 3352, Textile World Record.

Superintendent of Knitting Mill. American, 28 years of age, with experience on flat wool and cotton, all wool sweaters, rib goods of wool, worsted cotton and cotton plaited. Understands nearly all kinds of machinery used in making these goods. 3348, Textile World Record.

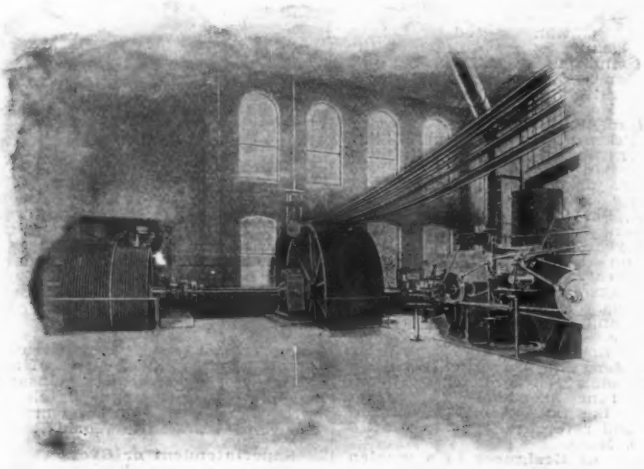
Superintendent or Manager of an underwear mill. Position wanted by a man 40 years of age, married and American. Has worked on all kinds of men's and women's underwear. Is familiar with Union Special, Merrow, Singer, National, Wheeler & Wilson and Imperial sewing machines and Nye & Tredick and McMichael & Wildman knitting machines. Has first-class recommendations. 1971, Textile World Record, Boston, Mass.

Overseer of Knitting. American, 31 years of age, with 10 years' experience in knitting room as second hand and overseer. Worked on men's gauze underwear, and on plain woolen and plush work. Wants position in the East. 3350, Textile World Record.

Superintendent or boss knitter. Worked on men's fine balbriggan, ladies', men's and children's wool underwear. Familiar with all kinds of knitting machinery. 27 years of age; American. 3259, Textile World Record.

Boss Knitter in underwear mill. Worked on all gauges as fine as 28, wool, cotton and silk. Latch and spring needle machines. 39 years of age, American, married. 1669, Textile World Record, Boston, Mass.

Foreman of Cutting Department in a knitting mill, or assistant. Worked on all kinds of knit goods, with four knife or by hand, with knife or shears on fine work. Will guarantee 100 dozen per day. Will not go South or Canada. 24 years of age; American. 3320, Textile World Record, Boston, Mass.



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If you have any problem involving power transmission write us and secure gratis the benefit of our many years' experience in dealing with same.

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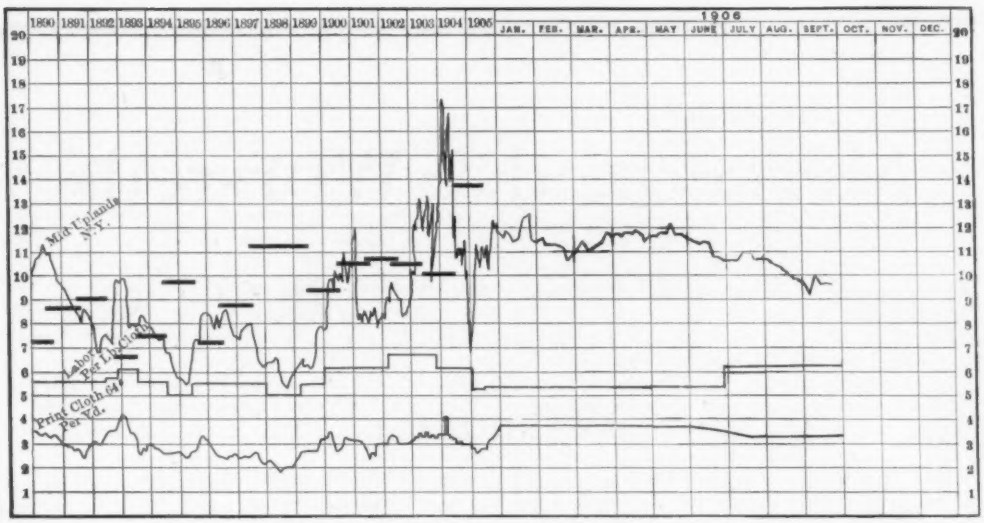
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GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Cotton Market.

Faith in a large crop has brought the price of cotton down a cent a pound during the last two months. Weather conditions have continued favorable and the bulls have been unwilling to risk their money on the chance of a killing frost. The receipts for the first three weeks of September have been less than expected, but it is too early to draw conclusions from these figures, in view of the increasing power of the planter to hold his cotton for higher prices. The cotton brought into sight from Sept. 1 to 21 for a series of years is estimated by the Chronicle as follows:

1906 Sept. 21,	597,229	bales.
1905 Sept. 21,	864,227	bales.
1904 Sept. 23,	820,767	bales.
1903 Sept. 25,	523,015	bales.
1902 Sept. 26,	1,635,784	bales.
1901 Sept. 27,	595,023	bales.

How little dependence can be placed on these early returns in estimating the coming crop is shown by the fact that in 1902 a crop of 10,500,000 bales was ushered in with 1,635,784 bales from Sept. 1 to Sept. 27, while in 1904 a crop of 13,700,000 bales was introduced by only 820,767 bales from Sept. 1 to Sept. 23.

The world's visible supply on Sept. 21 is estimated by the Chronicle at 1,794,365 bales, as compared with 2,735,823 bales on same date in 1905, 1,428,357 bales in 1904, and 1,157,462 bales in 1903. These figures show that the world has no large stock of cotton with which to fill the gap caused by any material shrinkage in the supply. Moreover the increase in the number of spindles during the past two years make the present stock no more than proportionately equal to smaller stocks of previous years. Under these conditions it is not surprising to find cotton manufacturers ready to take advantage of the present low level of prices and replenish the reduced stocks in their mills.

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NASHUA JUNCTION, N. H.
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Gulf and Peruvian—in the white
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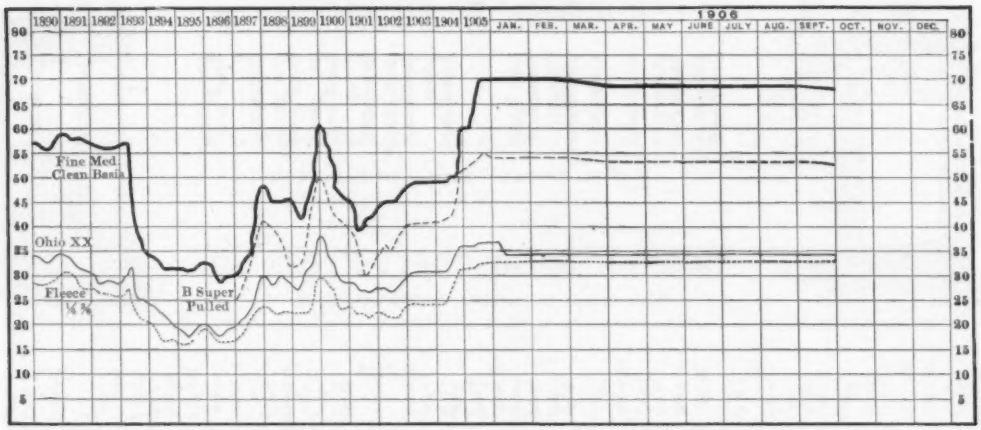


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

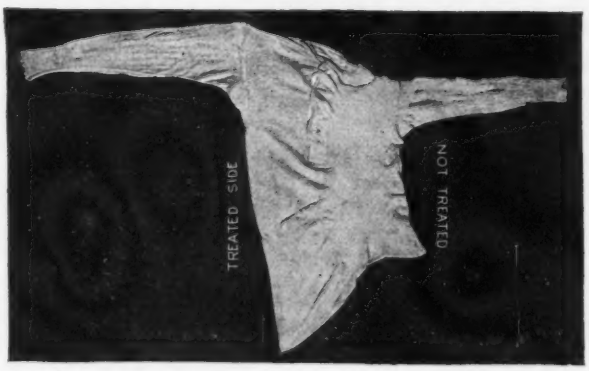
Wool Market.

Holders of wool have been more disposed to sell and the result is increased activity and in some cases slightly lower prices. The tight money market has been influential in bringing this situation about, but as a rule the wool trade has been well treated by the money lenders. Clothing wools have shown the greatest weakness, and large lots of territory have been sold to manufacturers at concessions in price. Combing wools have been firm and holders have turned down many offers below the asking price.

Although the sales of wool have been large there has been no disposition to speculate on the part of manufacturers. The wool bought has been mainly to cover sales of goods. Buyers appear convinced that wool cannot go up much, but may go down far below ruling prices. The mills making worsted goods or goods with a worsted finish have done a good business, but makers of woolen goods are short of orders or else are selling their product at a small margin of profit or none at all. The continued trend of fashion toward the worsted finish explains the depression in clothing wool.

*Pennsylvania, Philadelphia. William M. Ackerman, Harry Ackerman and Morris Ackerman, individually and trading as Ackerman & Bros., proprietors of the Excelsior Hosiery Mills, were on October 3d adjudged involuntary bankrupts. Theodore M. Etting has been appointed referee. The plant, which is located at Mascher and Oxford streets, has been shut down for several weeks.

TRADE IS DEMANDING NON-SHRINKABLE WOOL



BECAUSE THE

FOR WOOL
Never-shrink
Registered
IS WORKING A REVOLUTION

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REAL ESTATE TRUST BUILDING
PHILADELPHIA, PA.

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Any Size .. Any Power

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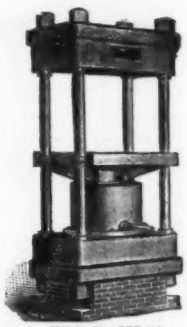
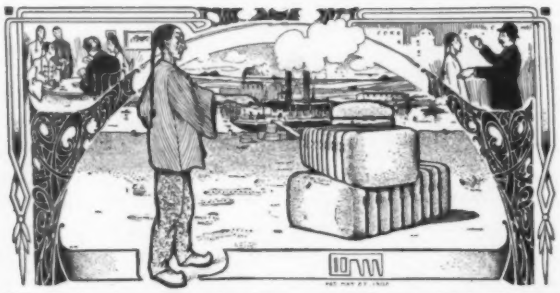


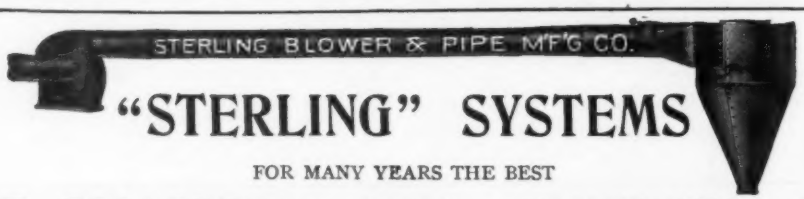
HYDRAULIC.

DeHaven's Galvanized Trojan Bale Tie



The heathen Chinese is peculiar but he "buckles" on to a good thing. The U. S. Consular report under date of January 23, 1906, referring to the baling of cotton goods for export to China, states:—"There is a lightweight metal band used by some American mills which is better than any in use..... The metal does not rust by contact with water or dampness as do ordinary iron straps." This refers to our Galvanized Trojan Bale Tie with patent buckle. Send for samples and be convinced.

DeHaven Manufacturing Company,
50 Columbia Heights, Brooklyn, N. Y.



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DUST COLLECTING, WOOL CONVEYING, ETC.

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Recording Gages
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Lubricators—Oil Cups
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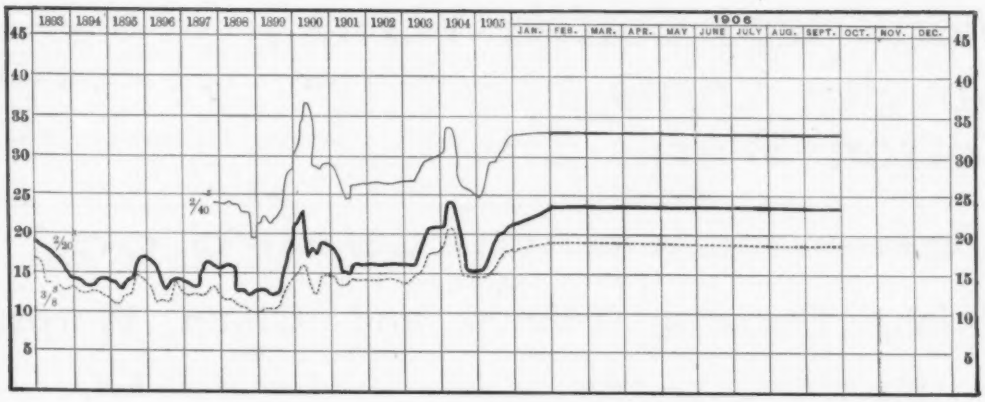
CROSBY STEAM GAGE AND VALVE CO.

Stores: BOSTON, NEW YORK, CHICAGO, LONDON
Office and Works: BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Cotton Yarn Market.

The decline in raw cotton has caused a falling off in the demand for yarn, buyers preferring to await further developments. There has been, however, practically no change in prices. Spinners are busy on contracts and are far behind on deliveries. The shortage of help has seriously interfered with the operations of the mills. Knitters and weavers have been clamoring for yarn due on old orders, while the spinners have had from 15 to 25 per cent. of their machinery idle for want of operatives. This condition makes the price of raw cotton of secondary importance in regulating the price of yarn. The supply that now fixes the prices for yarn is narrowed down to what the available help can spin, while the demand from the knitting and weaving mills is far in excess of all that the spindles, both idle and busy, could produce, while yarn prices would undoubtedly be affected by any break in the cotton market the yarn market is bound to remain largely a seller's market. We quote as follows:

Eastern Cops.

6s	18
8s	18¼
10s	18½
14s	19½
16s	20
18s	20½
20s	21
22s	21½
24s	22
26s	23
30s	24
34s	25
36s	26
40s	28

On cones, ¾c. more up to 14s; 1c. more from 15s to 22s; 1½c. from 23s to 35s, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12s	21
14s	21½
18s	22½
20s	23½
24s	24½
26s	26
30s	29
36s	35
40s	38
45s	41
50s	47
55s	51
60s	55

Eastern Two-Ply Warps, Carded Peeler.

2/30s	29
2/36s	35
2/40s	38
2/45s	41
2/50s	47
2/60s	55

Egyptian Weaving Yarns.
Single Skeins Combed.

30s	38
36s	40
40s	42
45s	45
50s	49
55s	52
60s	55
70s	60

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps.

DYE SULPHUR BLACKS DIRECT IN COPS, CONES OR TUBES.

Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS. 4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

Philadelphia Market.

The cotton yarn market has held very steady, with the exception of a few of the coarse numbers, which have shown some weakness. The demand for yarn continues good. Spinners are well sold ahead and most of them are behind in delivery on their old orders.

Complaints of insufficient help are very numerous and very few mills are getting their full production on account of the scarcity of operatives.

The cotton market has been rather unsettled, but this has had no influence on yarn in the finer numbers, as the demand for this class of yarn has been good enough to prevent any break in the price.

Spinners are so well supplied with orders for the rest of the year that we do not look for any serious cut in prices. In fact, conditions are more favorable for an advance in price rather than a decline. We quote as follows:

Southern frame spun cones:—

7s and coarser	18
8s and 9s	18
10s	18½
12s	19
14s	19½
16s	20
18s	21
20s	22
22s	23
24s	23½
26s	24
30s	25
40s	33
50s	38

Southern high grade mule yarn:—

Cones.

10s	20
12s	20½
14s	21
16s	22
18s	22½
20s and 22s	23-23½
24s	24

Southern frame yarn, lower grades:—

6s and 8s	17½
10s	18

Eastern cones (high grade quality):—

10s	20½
12s	21
14s	21½
16s	22¼
18s	22¾
20s and 22s	23¼-23¾

Skein yarn (mostly Southern).—

4s and 8s soft	17
10s to 12s	18-18½
14s to 20s	18½-20
22s	20½

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
AND COTTON CLOTHS.
122-124 Chestnut Street, PHILADELPHIA, PA.
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206 Chestnut Street, PHILADELPHIA.
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Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
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MERCERIZED TURKEY RED GASSED } COTTON YARNS.

E. D. LORIMER & CO.
COTTON YARNS } ALL NUMBERS
MERCERIZED YARNS } FOR ALL PURPOSES
346 BROADWAY, NEW YORK.

LUDWIG LITTAUER,
Successor to MOELLER & LITTAUER.
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK.

Wiscasset Mills Co. | Patterson Manfg. Co.
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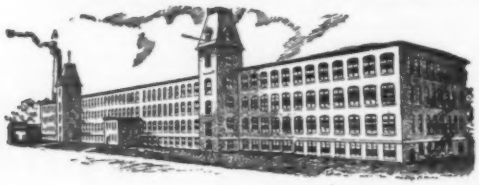
HIGH GRADE HOSIERY YARN
White and Colors. All Numbers.
Sewing Twines on Cones and Tubes.
SPECIALTIES IN WEAVING YARN.
Black and white. Double and twist for woolen trade.
CANNON MILLS, 55 Leonard St New York.

C. T. Crocker, Pres. W. F. Stiles, Treas.

ORSWELL MILLS



Fitchburg, Mass.

Capacity, 45,000 Spindles.

HIGH GRADE YARNS

From Egyptian and Peeler Cottons, Carded or Combed, in Chains and Skeins, on Balls, Beams, Spools, Cops, Cones, Tubes, Single or Twisted.

JENCKES SPINNING CO.

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Carded and Combed Cotton Yarns for Weavers and Knitters
Double and Twist Yarns for Woolen Trade.

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GRANT YARN CO.,

COMBED AND CARDED COTTON.

YARNS 40's and above. AND
FITCHBURG, MASS. WARPS

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PROVIDENCE, R. I.

Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.

GASSED .·. YARN .·. SPECIALTIES

C. MOORE & CO.,

Manufacturers of

TWINES, THREADS AND YARNS,

Jacquard Harness Twines of all kind on hand and made to order.

S.W. Cor. Fifth and Market Sts., Phila.

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Comprising

Comparative Yarn Tables, showing the equivalent sizes of different systems of Numbering Yarn and Different Standards.

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Compiled by the

TEXTILE WORLD RECORD

Price 50 Cents

LORD & NAGLE CO., Publishers

299 Devonshire Street, Boston, Mass.

Indian·Orchard·Company·
Cotton Warps and Yarns.
In Gray and all Colors. Single or two or more Ply and Cable Cord
Novelty Yarns.
in Various Patterns, Colors and Twists.
Carded and Colored Cotton.
for Mixing with wool, Machined or in Roving.
Indian Orchard, Mass.

14/2	18½
16/2	19½
20/2	21½
30/2	27½
40/2	36
16/3 slack	19½
12/3 slack	18½
8/3 carpet	17
8/3 slack	17
9/4 slack	17

Warps (Southern):—

10s to 12s	18
14s	18½
16s	19
20s to 22s	19½-20
26s	22½
14/2	19½
16/2	20
20/2	22
24/2	24
30/2	27½
40/2	36

Mixed colored yarns (mock twist, half colors):—

6s to 10s	19-19½
12s to 14s	20-21
16s to 18s	21½-22

Mock Egyptian, 2c. advance over white.

Egyptian, 7 to 8c. above best quality white.

Worsted Yarn.

Spinners are busy on some yarn while on other grades orders are running low and new business must be secured or some of the machinery will not be able to run. On fancy mixture yarn spinners are unable to keep up with the demand and in some instances so slow are the deliveries that weavers, although well supplied with orders for cloth, have looms standing waiting for yarn. On straight yarns salesmen are working hard for orders and while spinners are busy at the present moment, the end of this business is in sight unless new orders are secured.

Cotton yarn is displacing much worsted yarn in both men's wear and ladies' dress goods and though it is almost impossible to get prompt deliveries on southern cotton yarn equal to the worsted counts required, yet on worsted yarn spinners are anxious for new business to keep going. Much 2/36s yarn is being dropped in the manufacture of dress goods and cotton straight yarn and cotton mixes are substituted. The French spinners are the busiest supplying filling

Established 1863 *Incorporated 1893*

W. Warren Thread Works

Makers of High Grade

SPOOL COTTON

of every description for the manufacturing trades

Mills: Westfield, Mass.

LINEN YARN IMPORTER.

HUGHES FAWCETT, 115 Franklin Street, NEW YORK.

Flax, Hemp and Jute Line and Tow Yarns,
For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps,
Cones, Cops,
Tubes
COTTON YARNS
426 and 428
Market St., Phila.
Theo. H. Strouse & Co.

HEGEMAN SEAMLESS BOBBIN COVER.

The best, cheapest and most satisfactory covering for winder bobbins. Will fit on any style or size.

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MILL SUPPLIES
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SOLE AGENT FOR
Adams' Patented Latch Needles

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WOOL, SILK, MOHAIR, CAMEL HAIR, RAMIE.
Ramie Tops, Ramie Noils, Silk Tops, Silk Noils,
Ramie Yarns, Silk Yarns, Silk Noil Yarns.
Prepared Tussah Silk for Woolen Manufacturers, ready for immediate use on regular woolen machinery.

G. J. MERWIN, Prest. and Gen'l Mgr. **FREDERICK A. BETTS, Sec'y and Treas.**

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Press Papers and Fender Boards
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Pocasset Worsted Company,

WORSTED YARNS

IN THE GRAY.

Mills at
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100 Boylston St., Boston, Mass.

French System. **B. F. BOYER CO.,** Bradford System.

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, Delaware and Cooper Streets. **CAMDEN, N. J.**

Woolen and Merino YARNS

Eaton Rapids Woolen Mills,

EATON RAPIDS, MICH.

EDDY & STREET,

Cotton, Woolen

Yarns and Braids

Worsted, Spun Silk.

PROVIDENCE, R. I.

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Bristol Worsted Mills,
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300 Chestnut Street,
PHILADELPHIA. PA.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.
Mills: Frankford, Pa.

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Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

YARNS Solis, Boston.
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SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

HOFFMAN, DeWITT & McDONOUGH CO.,

Diamond Stay Bindings
TRADE MARK

Manufacturers of
Tapes, Webbing and Bindings.

COTTMAN and G STS., PHILADELPHIA
Ryer's Station, P. & R. R. R.
Bell Telephone, 293 Cheltenham.

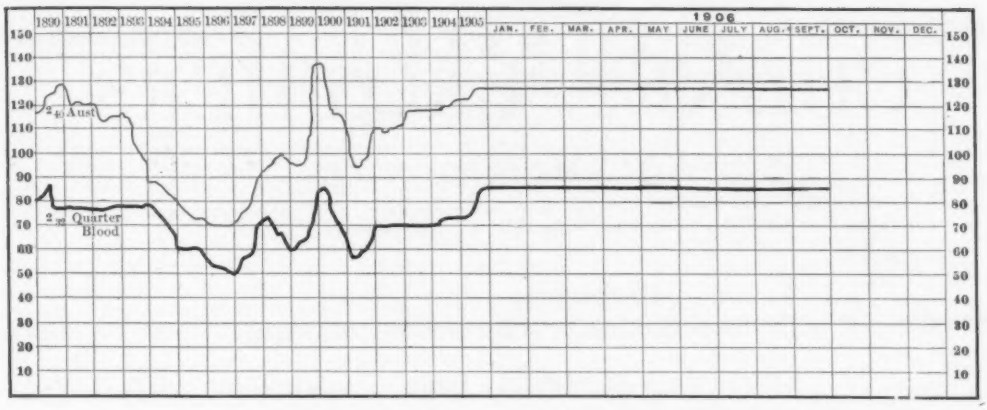

CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

yarn for mercerized cloth and also for underwear and hosiery. The buyers of yarn are very conservative as they believe that the price of yarn will not reach a higher level than at present and in consequence they will buy from time to time. This is carried along from the buyers of cloth who in some instances are withholding orders. For instance, we know of one large weaver who states that his commission house has orders for 300 pieces of a certain line of worsted cloth and yet they are getting orders only in small lots, the idea being that this method will force the spinner to reduce his price, but notwithstanding the slow business spinners can make but few concessions in price on account of the price of wool.

Most of the demand for yarn and wool out of which to make yarn, is for 3/8 to 1/2 Blood quality. Notwithstanding the slow business now it is believed that by December the weaving mills will be swamped with duplicate orders, as everyone knows that the greatest part of the business is to come when the duplicate orders are placed. The present business for cloth has been very unevenly distributed. Some weavers sold up in ten days after showing samples and will never be able to deliver all the orders accepted. Some mills are running four and five nights each week and some of the weavers even on worsteds have missed it entirely and are getting out new lines. The mills best employed are those running on the better grades of mercerized worsteds and on cotton worsteds. The poorer grades of mercerized goods have been poor sellers this season.

The buyers state that in two or three months they will undoubtedly be on the market for much worsted yarn. There are many different ideas on this subject. Some state that they do not want to have any surplus yarn on hand next July, but have contracts which carry them until next February. Others state that they think prices are as low now as they will be this year. They point out the fact that although the buying of yarn is slow the mills are well employed with most of the machinery running to its full capacity. The combers are having but a fair business and we note many yarn salesmen and spinning mills looking for orders. The French spinners are securing more orders than any of the others. The hosiery manufacturers are very busy and are unable to deliver the orders which they have secured. Users of worsted yarn for underwear purposes state that next season a better demand will be the order as the trade is looking for a better class of fabric.

We quote:

2/40s Australian	1.28
2/40s Delaine	1.23
2/36s 1/4 to 3/8 Blood	95 to 1.00
2/32s 1/4 Blood	.85
2/20s 1/4 Blood	.82

Woolen Yarn.

Spinners continue busy on commission work for the underwear and hosiery trade, also for certain kinds of specialties. The men's wear woolen manufacturers are not busy, but this is the only branch of the industry that is not in a healthy condition. Undoubtedly the next heavy weight season will show a great improvement and within the next year the men's wear trade will again swing to a large proportion of woolens. The knitting branch of the woolen industry has never been so prosperous as at present. Although the mills are running and are using much woolen spun yarn and stock, they are placing but few orders for material; all are holding off awaiting developments.

CHENEY BROTHERS

Silk Manufacturers,

SOUTH MANCHESTER, CONNECTICUT.

Trams, Organzine and Spun Silks in the hank, or on spools and cones.

Silks for electrical uses, insulation and special purposes made to order.

Knitting Silks, Ribbons and Piece Goods for Trimming Knit Goods.

Pure Dye and Fast Colors Warranted

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 210 Monroe St.—Boston Office, 78 Chauncy St.

Crochet Lace Edgings

Spun Silk, Splicing Yarn, Mercerized Yarns, Cotton Warps, Sewing Threads, Tapes, Braids, Domets, Cambrics, Silesias.

Write for Prices and Samples.

George W. Chapin, 229-231 Church St., Philadelphia.

NON-FLUID OILS

WHENEVER OIL DRIPS

It wastes lubricant, spatters floors, ceilings and walls, increases fire risk, damages goods in process of manufacture, makes belts slip and ruins the leather, makes extra labor in wiping machinery and filling the cups—and the advantages of fluid oils?

Not a single advantage that Non-Fluid Oil has not and **Non-Fluid Oils do not drip**

It will certainly pay every engineer machinist, and factory superintendent and plant owner to investigate Non-Fluid Oils. Interesting booklet and samples free.

NEW YORK & NEW JERSEY LUBRICANT COMPANY,
Dept. H. 14-16 Church Street, New York City.

One large manufacturer told the writer that all the yarn and stock he bought was for the next year's business and if there was any advantage in waiting he proposed to have it and therefore should not do much buying until November and December.

FACTS AND GOSSIP.

Massachusetts, Lowell. The Halebrook Manufacturing Company has been incorporated with capital stock of $15,000 for purpose of manufacturing woolen goods. John D. Deavitt of Lowell is president of the company and D. N. C. Hyams, Canton, Mass., treasurer.

*Massachusetts, Newburyport. Messrs. Evans and Brewster, temporary receivers of the Bay State Cordage Co., have been ordered discharged by Judge Schofield of the Superior Court and the property restored to the corporation.

*Massachusetts, Plymouth. The power house of the Plymouth Mills, not a textile mill, is to be rebuilt.

Massachusetts, Spencer. The Priscilla Mills Company has been incorporated with capital stock of $3,000 for manufacturing shoddy, woolens, etc. E. R. Ware is president of the company and E. N. Osborn, treasurer.

New Jersey, Gloucester. The old Gloucester Gingham Mills, which have been idle for the past ten years, have been purchased by the Gloucester Paper Mills, who will start them upon roofing felts, etc.

New Jersey, Hudson City. It is reported that a new silk plant is to be installed in the new building to be erected at Sherman Avenue and Griffith Street by Hugo Grossenbach of the Arion Singing Society.

*North Carolina, Cooleemee. The Erwin Cotton Mills Co., recently reported having purchased the Cooleemee Cotton Mills, will operate same in future as No. 3 mill of their plant.

North Carolina, Roanoke Rapids. It is reported that plans are under way for starting work on the erection of a $500,000 cotton mill at this place. The new mill is to be operated by electricity.

G. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Sec'y.
Established 1880—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.
Boston Office, 200 Summer St.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Philadelphia.

Knitting and Weaving
YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
226 CHESTNUT STREET,
Philadelphia, Pa.

This may interest "you"

In the Southern and the Southwestern portions of the United States, there are seven cotton-growing States and Territories traversed by the numerous lines of the

Rock Island FRISCO

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Send for illustrated booklet "Opportunities" and other printed matter regarding the Rock Island-Frisco territory.

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Room 1327, Railway Exchange
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Resources, markets and advantages for manufacturing the raw material are unexcelled. The Land and Industrial Department of the Southern Railway is always ready to advise with manufacturers of textile commodities as to the best locations, placing at their disposal information that is succinct but convincing, dealing with every undertaking from a standpoint beneficial to the manufacturer. Go where you receive the best results is our motto and why we want you to come South.

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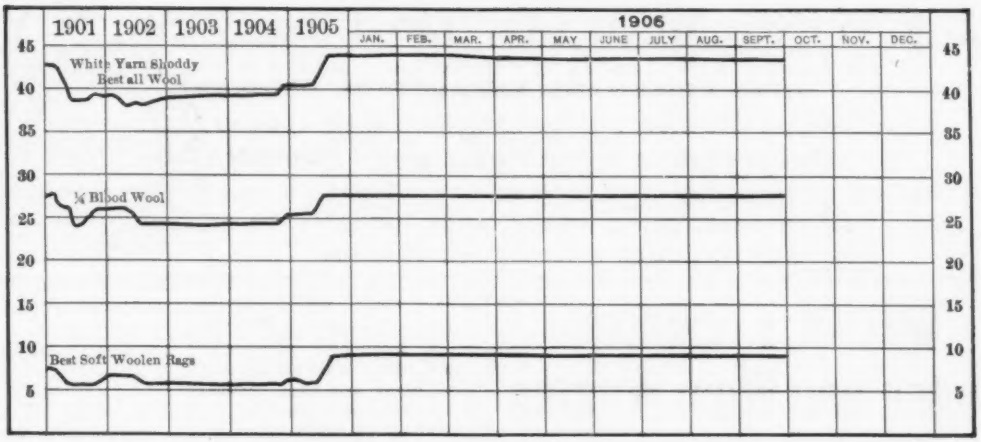

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Lethargy still rules these markets. With the demand for goods still running to worsted fabrics and finish, cloth manufacturers are forced either to use worsted or cotton, and as a result the waste and shoddy trade suffers. Collectors have been remarkably successful in preventing accumulations of stocks and consequent lowering of prices. Recently, however, large stocks of the cheaper grades have accumulated and as a result prices have been lower.

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White knit, all wool, best fine	35-40
White knit, No. 2	30-35
Light yarn, extra fine	30-35
New pure indigo blue	28-30
Merino.	
Fine light, all wool	24-27
Medium light, all wool	15-17
Fine black, all wool	25-27
Fine dark, all wool, best grade	22-25
Medium dark, all wool, No. 1	18-20
Medium dark, all wool, No. 2	15-16
Red knit stock, strictly all wool	20-22
Red flannel, all wool	20-22
Dark blue for hosiery, strictly all wool, No. 1	20-22
Dark blue for hosiery, not all wool, No. 2	15-18

WOOLEN RAGS.

Fine merchant tailors	10-11
Choice light colors	13-14
Browns	12-13
Blacks	9-10
Fine blues, plain	9-10
Fine dark	12-13
Medium dark	7-8
Worsteds.	
Blue	15-17
Black	21-22
Serges.	
New black	16-18
New blue	14-16
Flannels.	
New scarlet	19-20
New blue	15-16
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	9-9½
Old white flannels	23-24
White flannels, No. 2	11-12
Old red flannels	13½-14
Light blue flannels	7½-8½
Old blue flannels	9½-10
Old plaids	7-8½
White stockings	24-25
White hood stock	24-25
Clear hoods	9-10
Blue stockings	8½-9
Fancy stockings, No. 1	9½-11
Gray stockings	10½-11
Black stockings	11-12
Knit stock comforters	7-8
Red knit	13½-14
Light gray knit	10½-11
New light fancies	14-15
New fancies	11-12
Merinos.	
Light, fine	16-17
Light, coarse	7¼-7½
Fine, dark	14½-15½
Coarse, dark	6½-6¾
Blue	11-12
Blue—seamed	
Black—seamed	15-16
New black	18-20
Small	4¼-4¾
Bunting	7-10

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Fine dark, all wool	2½-4
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No. 1 black, all wool cut	6-10

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No. 1 Spinners	10-10½
No. 1 Machine Cop	8¼-8¾
No. 2 Machine Cop	7½-8
No. 1 Cop	8½-9
No. 1 Card	8-8½
No. 2 Card	7½-8
No. 1 Oily Card	4½-5
No. 2 Oily Card	3½-4
Peeler Combing	10-10¼
Egyptian Combing	10-10¼
No. 1 Linters	6-6½
No. 2 Linters	5¼-5¾
White Clips	4½-5
Colored Clips	1½-2¼

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Tartaric crystals	28-28¼

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ground	1.85-1.90
powdered	2.75-2.80
Aqua ammonia, 16 deg.	3¾-4
Ammoniac, sal., gray	6-6¼
Borax, bbls.	7½-8½
Brimstone, crude, foreign ton	22.12½-22.62½
Copperas	52½-65
Cream tartar, crystals	22½-23¾
Fuller's earth, lump, 100 lbs.	
powdered	80-85
Glauber's salt	50-55
Potash, chlorate, crystals	8½-9¼
powdered	8¾-9½
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LIABILITIES (including Capital)	**12,518,551**
NET SURPLUS OVER ALL LIABILITIES	**8,720,501**
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Soda, caustic, domestic, 60 per cent.	1.85-1.90
Sal. English	85-90
Sal. American	70
Sulphate, alumina	1-1¾
Vitriol, blue	6.15-6½
Dyestuffs.	
Acetate of soda	4¼-4½
Acid, picric, best crystals	22-27
tannic, commercial	32-35
Albumen, egg	53-80
blood	20-27
Alizarine, red	15½-16½
Aniline, oil	11-11½
salt crystals	9½-10
Antimony salt, 65 per cent.	24½
Bichloride of tin, 50 per cent.	10½-11¼
45 per cent.	9½-10¼
Bichromate of potash, American	8⅛-8⅜
Bichromate of soda	6⅛-6⅜
Bisulphite of soda	80-1⅜
Cutch, mat	
boxes	6¾-7½
Dextrine, imported potato	5¾-7
corn	2.75-2.90
Divi-divi, ton	55.00-65.00
Flavine	23-40
Fustic, stick, ton	17.00-20.00
young root	45.00
Gambier	4.00-4.125
Hypo. of soda, Am. bbls. cwt.	1.40-1.50
Indigo, Bengal, low grade	52½-55
medium	60-65
high grade	75-85
Kurpahs	47½-60
Gautemala	35-70
Manila	43-45
Madras	42-45
J. (Synthetic)	18-20
Indigotine	95-1.80
Logwood, stick, ton	17.00-21.00
roots	16.00-17.00
Madder, Dutch	12-14
Muriate of tin, 36 degrees	9-9¼
52 degrees	15-15¼
Nitrate of iron, commercial	1⅛-1½
Nutgalls, blue Aleppo	23-25
Persian berries	7
Phosphate of soda	1.80-2
Prussiate of potash, yellow	17
Quercitron, ton	20.00-22.00
Starch, corn, pearl, bbls.	2.35
corn, pearl, bags	2.20
potato	3¼-4
rice	6½-7
wheat	4¾-5¾
Stannate of soda	10-20
Sumac, Sicily, No. 1, ton	52.00-54.00
Sicily, No. 2, ton	50.00-52.00
Tapioca flour	2⅜-4
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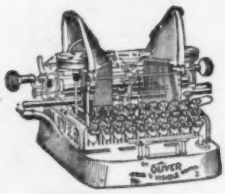

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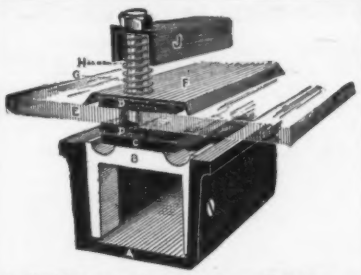

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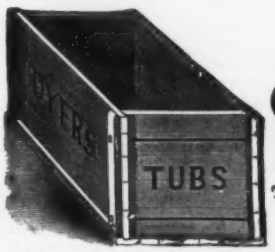

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2915-2933 North Second Street,

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Tubs and Tanks of all kinds for Dyers, Bleachers, Factories, etc.

Down Town Office, 140 Chestnut Street, Corner Second.

Hours from 12 to 1

G. WOOLFORD WOOD TANK MANUFACTURING CO.

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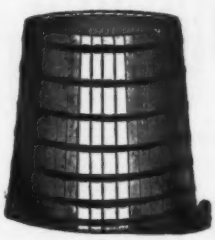

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For Bleaching, Dyeing and Finishing.

Reservoir Tanks of any Capacity or Shape for Sprinkler Systems and all purposes.

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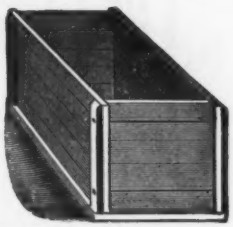

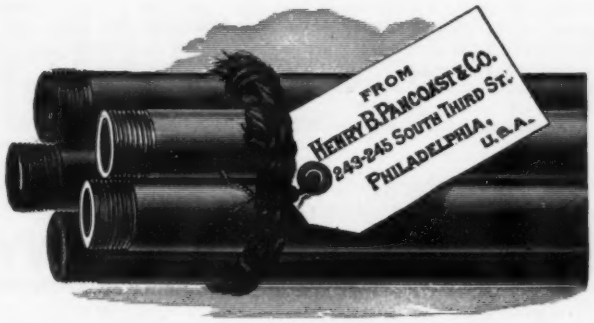

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for steam, water and gas.

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PIPE CUTTING A SPECIALTY.

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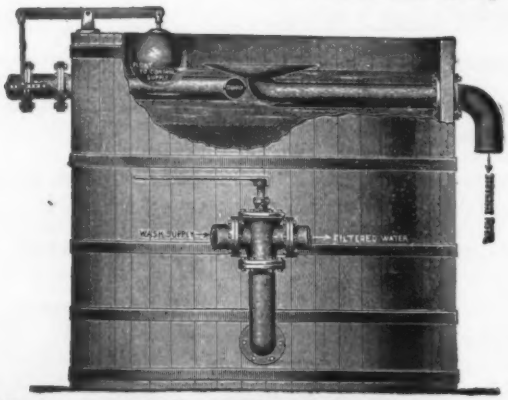

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Our filters are already in use in a number of the representative textile mills of the country, from whom we have received many expressions of satisfaction. Our representative will call and explain our system whenever desired.

"The Chemistry AND Practice of Finishing"

BY

PERCY BEAN, F.C.S., M.Ph.S.,

Expert on Sizing, Dyeing and Finishing. (Author of "The Chemistry and Practice of Sizing.")

AND

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It has been more than fifteen years since a complete treatise on this subject has been offered to the Trade, and during that time there have been wonderful advances made in the Chemistry and Practice of Bleaching and Finishing.

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We recommend the book as being worth the price.

Owing to the limited available supply, we suggest that those who are likely to want a copy should order at once and avoid a long delay.

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Beaumont's Patent Cop Dyeing BLEACHING and SIZING MACHINES

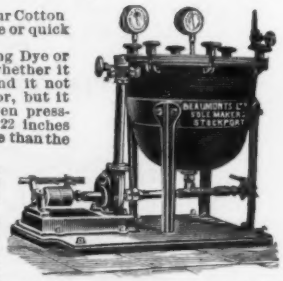
VACUUM MACHINE.

This machine will dye large, hard twisted, twine cops. It will dye or bleach any size of cotton cops. It will scour wool or worsted cops, cheeses and tops. It will scour or dye waste cops. This is a good machine to work in conjunction with the Vacuum and Pressure Machine for washing off, etc.

Vacuum Machines made of Copper and Brass	No. 1	No. 2	No. 3	No. 4
	£30	£45	£85	£130
Machines made of Iron	28	38	65	90

This machine will Dye, Bleach, Size and Scour Cotton Hemp, Woolen, etc., in the form of Cop, Cheese or quick traverse bobbins, any thickness or length.

This Machine will circulate absolutely boiling Dye or Size Liquor through every fibre of the yarn, whether it be cop or cheese which is under treatment, and it not only circulates this boiling Dye or Size Liquor, but it forces it into the fibre of the yarn under an even pressure of 10 lbs., and this is more than equal to 22 inches of vacuum; it is **three times** more effective than the ordinary Cop Dyeing Machinery.



This machine will dye evenly and thoroughly through every fibre of the Cops while the spare Cop plate is being refilled with Cops; **in fact it will do this in six minutes.**

Can be depended upon to dye a perfectly even shade all through the yarn, and will dye the most delicate colors. It will dye silk Cops or treat them with any necessary liquor. It will scour or dye wool tops. It will scour or dye large hemp cops and cheeses. It will scour and dye waste cops. We are the Patentees and Sole Makers.

Machines made of Copper and Brass	No. 1.	No. 2.	No. 3	No. 4.
	£40	£65	£115	£170
Machines made of Iron	35	50	75	110

We supply Two Sets of Skewers and Two Cop Plates with the Machine, whether it is for Weft Cops, Twist Cops or Cheeses.

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Factories at
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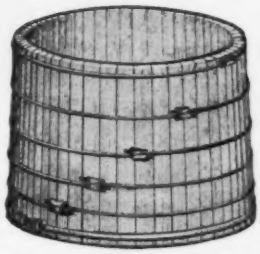

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Printing Rollers
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Taunton-New Bedford Copper Co.

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Our Guarantee:

Superior Quality. *Prompt Shipments.*

THE COHNEN

CENTRIFUGAL

Dyeing Machine

U. S. Patent 776,295, Nov. 29, 1904.

Dyes Raw Stock
or
Yarn in Cops, Skeins or Bundles (Warps)

DYES SULPHUR COLORS

without bronzing or streaking and leaves the stock in perfect condition for carding or weaving.

ONLY ONE HANDLING

is required to dye, oxidize and hydro extract ready for the drying room.

The Machine may be seen in operation by applying to the American Agents.

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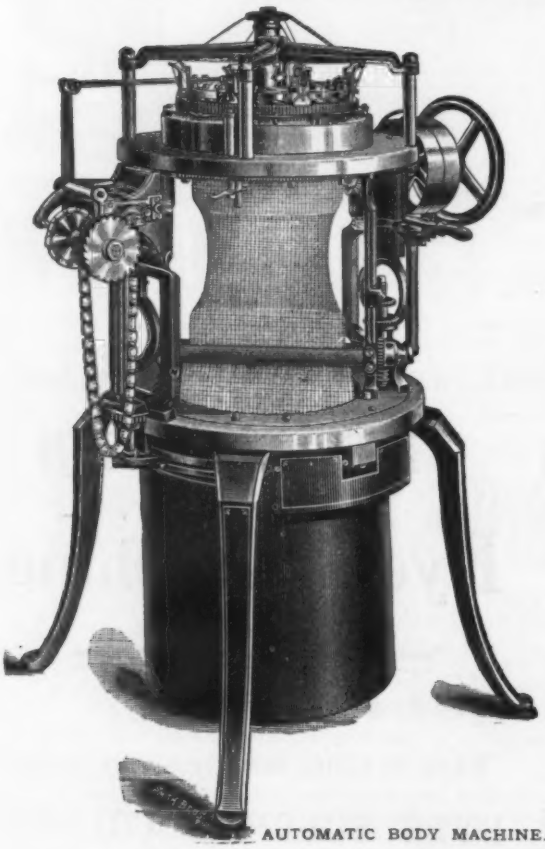
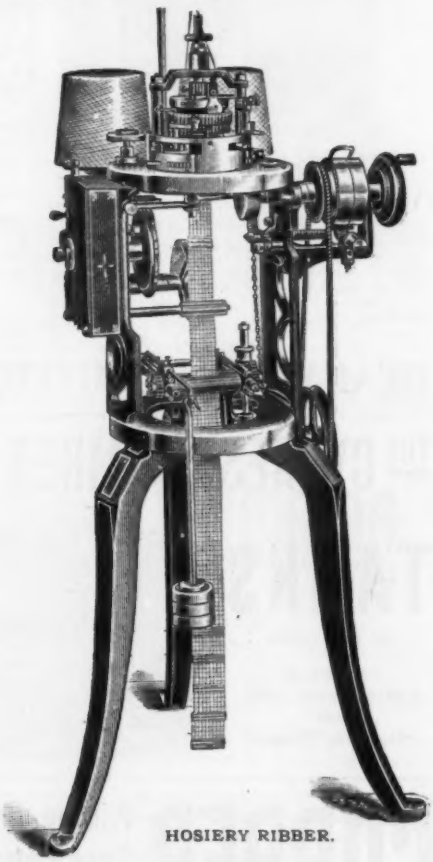
CIRCULAR RIB KNITTING MACHINERY

AUTOMATIC AND PLAIN

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



AUTOMATIC BODY MACHINE.



HOSIERY RIBBER.

ESTABLISHED REPUTATION FOR LARGEST PRODUCTION,
BEST QUALITY FABRIC, DURABILITY, ECONOMY OF OPERATION.

Full Particulars, Description and Samples Furnished upon Application to the

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The most advanced types of straight bar

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for the manufacture of full-fashioned hosiery (cotton, lisle or silk), in all gauges from 14 to 32 needles (spring beard) to the inch, from 12 to 24 sections; for the manufacture of full-fashioned shirts and drawers from 6 to 10 sections with automatic narrowing and widening, built by

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in Cotton-system, of superior quality and construction, with split, striping, single and double lace attachments.

Also machines with latch needles, hand or power motion, for the manufacture of Sweaters, Cardigan Jackets, Ladies' Blouses, Vests, Gloves, Mittens, etc.. built by

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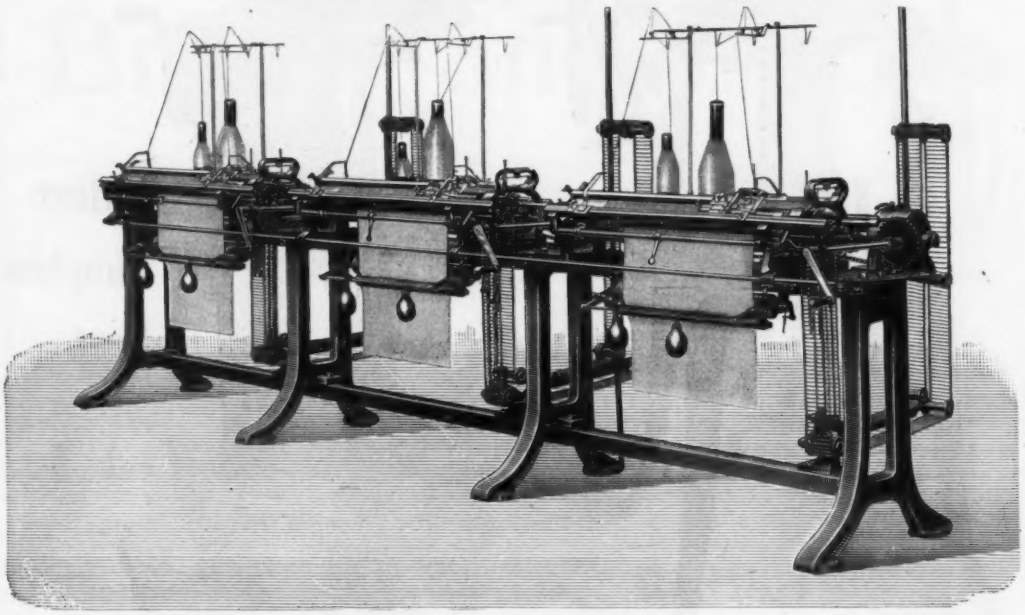

This picture represents one of Seyfert & Donner's full automatic power knitting machines, with chain drive. Each head on stand works independently and can have needle beds of different gauge and width. The machine is fitted with three automatic thread-carriers, two for striping and one for the dividing thread, self-acting lock for welt and royal rib, racking arrangement for whole or half revolution, take-up rollers for endless goods, automatic and electric stop motion.

OTTO WALTHER,

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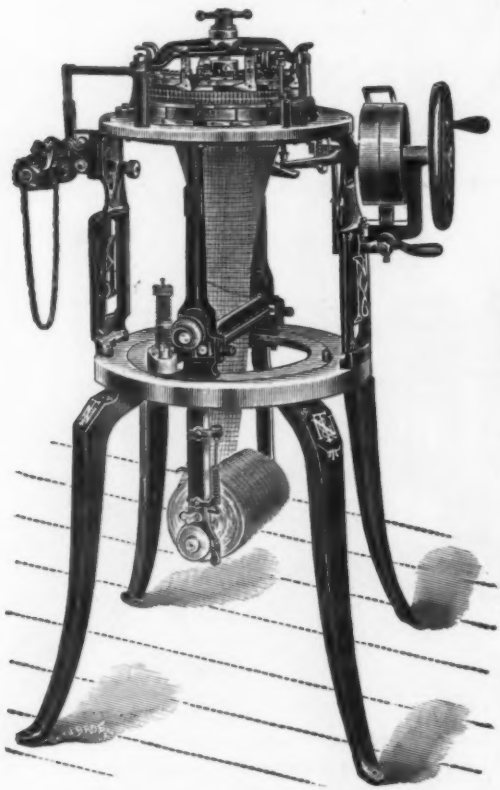
NYE & TREDICK CO.

Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

Correct Construction. Excellence and Durability.



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QUALITY OF FABRICS AND PRODUCTION
UNEXCELLED

NYE & TREDICK CO.
606 Arch St., PHILADELPHIA, PA.

If You Want

Largest Production For Least Money

Write

Geo. D. Mayo Machine Co.,
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Latest
Simplest
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MAYO'S

New Full Automatic Knitter.

PHILADELPHIA OFFICE,
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Braids and Laces

The recognized

Standard Finish

For Trimming

Ladies' Ribbed Underwear

Germantown, Philadelphia

P. O. Address, Logan Station

JAMES TAYLOR,

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ALL KINDS OF NEW AND SECOND HAND

KNITTING MACHINERY

A RARE OPPORTUNITY TO BUY.

500 Payne bobbins.
1 Bruce band folder and cutter.
1 Weston & Dennis Press, 32x40 in., 15 Hollow Plates.
Lot hosiery stamps, boards, etc.
38 Beattie & Hepworth & Abel loopers.
6 Hosiery presses (lever).
114 Lamb and Grosser sweater machines.
200 Ribbed underwear machines, various sizes.
50 Brinton & Co. ¼ aut. knitters, sizes.
30 Union Special machines, various styles.
1 Rotary fire pump.
1 Buffalo-Blower.
100 feet woven rubber hose, 3 inches dia.
2 paper cutters.
5 Toque machines.
30 Mayo machines. Various sizes.
100 Brooks welters.
8 Fleecing machines. (Nappers.)
98 Brinton & Co. and other make hosiery ribbers.
40-Ribbed shirt machine cylinders and dials, all sizes, cuts and makes.
4 Lindsay & Hyde winders.
2 Grosser Jacquard machines for gloves.
1 Cyclone dryer.
2 Typewriters. 1 Fisher Billing Machine.
5 Band folding and cutting machines.
4 30-in. ventilating fans. 1 36-in. ditto.
1 Centrifugal Pump.
1 Small Steam Pump. 1 Small Belt Pump.
15 Rudolph Sewing Machines.
2 Lamb border machines, auto. rack.
4 Payne Cop Winders.
7 Abel Cop "
1 Dinsmore Railway Sewing Machine.
1 Globe power Eyelet Machine.
20 Leighton Sweater and Underwear Machines.
1 Troy Mangle 64" wide.
4 Klauder-Weldon Skein Dye Machines.
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25 Standard B. Machines.

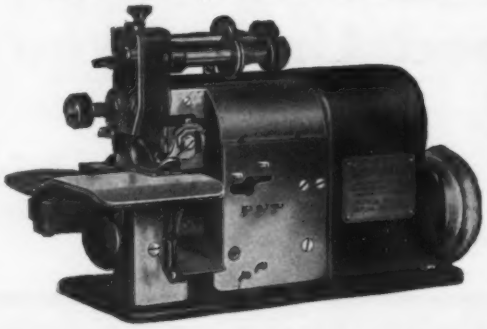
WRITE FOR COMPLETE LIST. APPRAISEMENTS A SPECIALTY.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.

The Merrow

FAST
DURABLE
Light Running

High Speed Overseaming, Overedging and Scallop Stitch Machines are



OUR NEW STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

USE STYLE 18 for Horse Blankets. STYLE 17 or 22 for Bed Blankets. STYLE 35 B SHELL, for Necks and Fronts of Rib Goods, produces the most showy, substantial finish.

Send for Catalogue and Samples.

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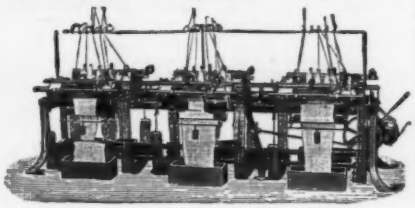
FOR ANY ARTICLE THAT IS KNIT

GROSSER Flat Knitting Machines

For HAND power or **Fully Automatic Power Machines.** Most productive and best machines for Sweaters, Jackets, Blouses, Wool Hosiery, Gloves, Mittens, Sporting Goods in Plain, Fancy and Jacquard Work, Shaker Articles, etc. Large stock on hand. Power Machines to be seen in operation.



COTTON PATENT HOSIERY MACHINES
For automatic production of **Full Fashioned Hosiery, Fine Half Hose, Ladies' Lace Hose, Fine Underwear**; high speed, large production. All guages and any number of sections, from 2 to 24.

FRENCH FRAMES
C. TERROT SÖHNE, Cannstatt, Würt, famous builders of the best Circular Frame for **Finest Underwear, Fleece Linings, Gloves, Special à-jour** (open work) **Fabrics, etc.**

RASHEL MACHINES
For Fancy Goods in largest variety, **Shawls, Capes, Caps, Borders, Fringes, Lace Work, etc.,** in silk, wool, cotton.

SPOOLERS, Paraffiners Finishing Machines, for the knitting business.

Exclusive Agency for the Famous

Julius Koehler DIAMANT OVERSEAMERS, indispensable for all full fashioned articles, **Hosiery,** Gloves, Jersey Sweaters, Sporting Goods, etc.

LOOPERS Double thread Lock-stitch, self-cutting and cleaning attachment. Reliable money saver.

FRITZ ZACKE LATCH NEEDLES for any purpose in the knitting line, patented rivets.

Samples, Specifications, Prices, etc., upon application.

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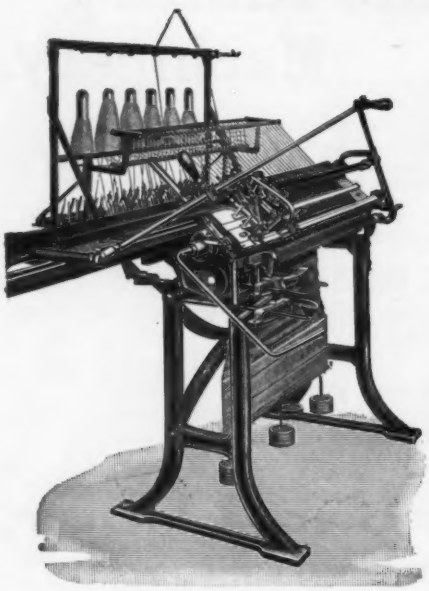

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Knitting and Winding Machines

for hand and power driving, of best quality and perfect construction.

Specialty: Jacquard Machines

for hand and power driving for manufacturing of sweaters and every possible fancy article of that nature.

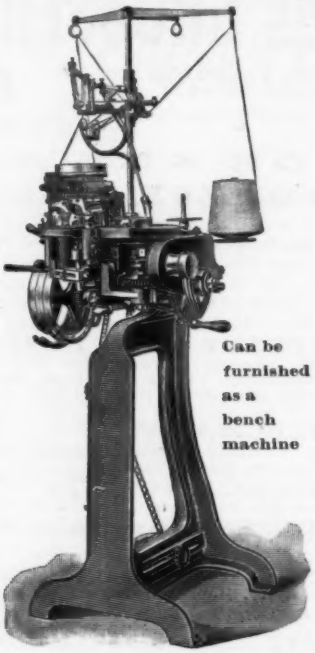
PRICE LISTS AND SAMPLE ON APPLICATION

The Invincible

Full Automatic.

"The KNITTER that KNITS"

THE LARGEST PRODUCER OF PERFECT WORK.
SIMPLE, POSITIVE AND EASY TO OPERATE.



Can be furnished as a bench machine

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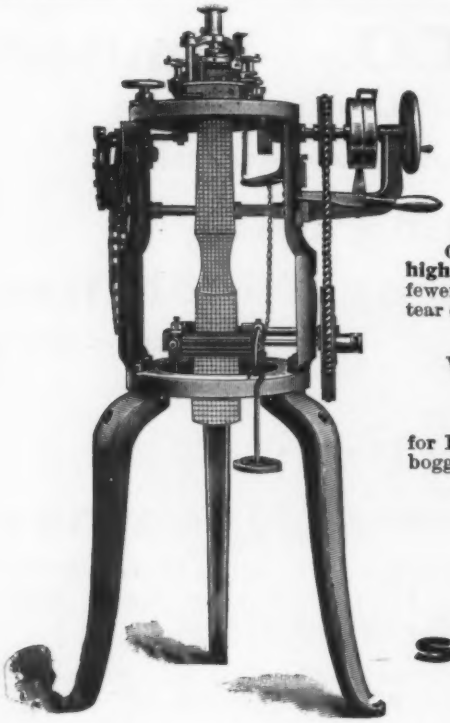
PHILADELPHIA OFFICE, 101 North Sixth St.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at very high speed, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

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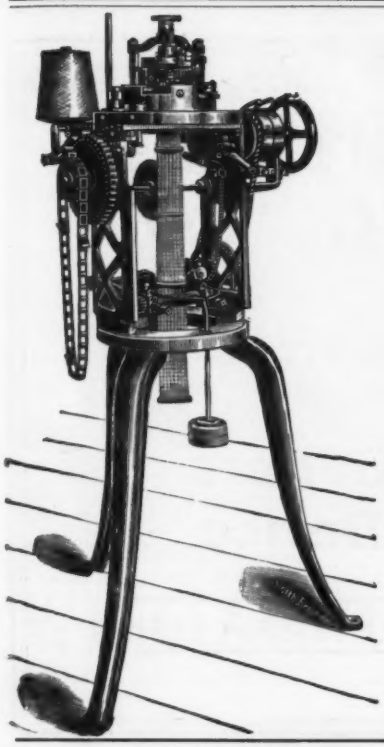

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BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

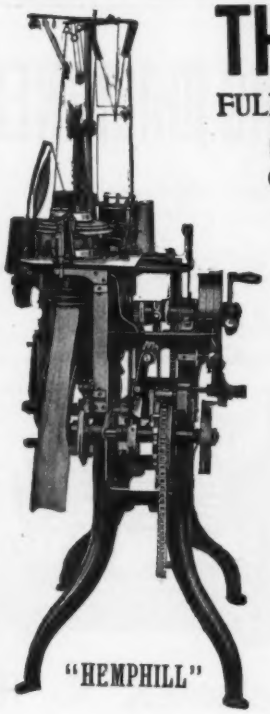
Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

THE TWO LEADERS

FULLY AUTOMATIC HOSIERY KNITTERS

FOR MAKING ALL KINDS AND GAUGES OF SEAMLESS HOSIERY



"HEMPHILL"

One with **GEARS**, the other with **CHAIN** for pattern mechanism, to meet the various tastes of different manufacturers.

Both used and approved by leading hosiery manufacturers.

Both contain all the well-known essentials demanded of first-class knitting machines.

With these two machines we can supply all manufacturers' possible wants in the best possible manner.

Write us for further particulars and prices.

We also make all kinds of **LATCH NEEDLES.** Many leading manufacturers use our needles and say they are the best on the market. Send us a trial order.

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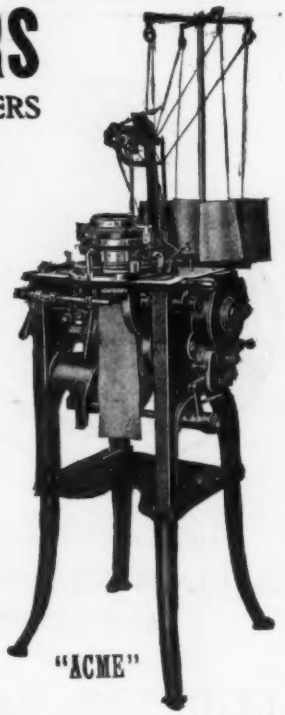

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EXCELSIOR KNITTING MACHINE MFG. CO.

Meadow and Washington Streets

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BUILDERS OF

Full Automatic Knitters

With or without **Transferring Device**

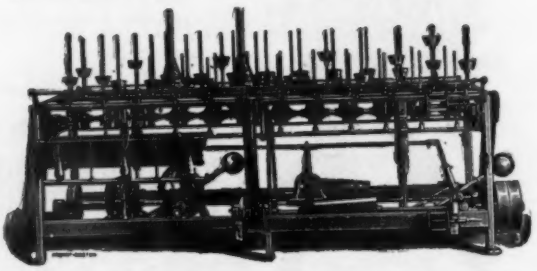
ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete. 4 to 24 feeds for

RIBBED UNDERWEAR

Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.



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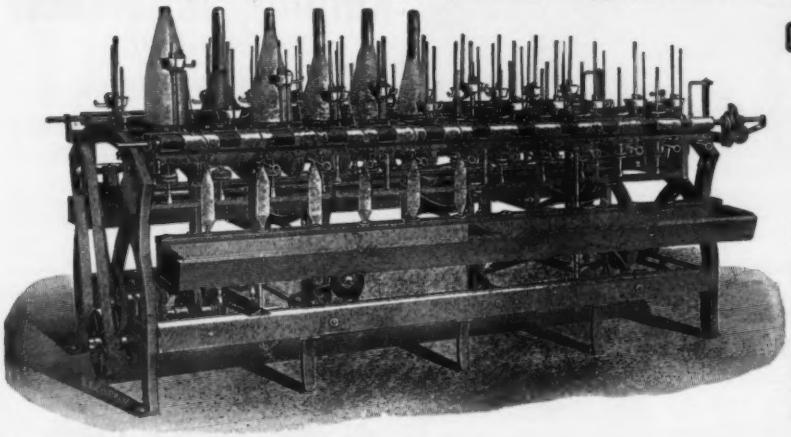
ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO., - Manchester, N. H.

GEO. W. PAYNE, Prest. J. MILTON PAYNE, Treas. CLINTON F. PAYNE, Sec'y.

OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



GEO. W. PAYNE CO.,

[Est. 1885. Inc. 1903.]

Builders of the

Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quills from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

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MAKER OF

For Ladies', Gents' and Children's Goods.

Latest Styles.

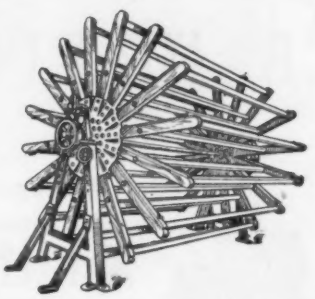
Best Workmanship.

Drying Form Boards

OF EVERY VARIETY.

Leaves yarn in beautiful condition—
Bailey's Cold Air Drying System

Yarn dried by this system is much softer, winds and weaves better, shows less percentage of waste and the colors develop better. In use in over two hundred mills. Simple, effective, inexpensive. Investigate its merits for your profits sake. Where great capacity is wanted my *hot air system* is unequalled.



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ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS.

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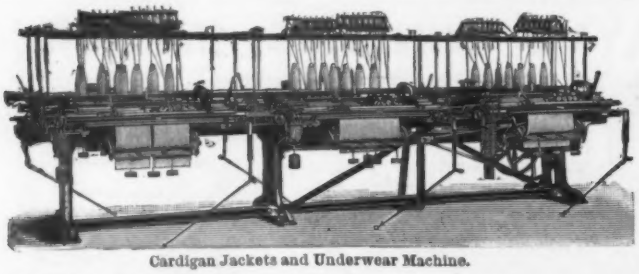

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THE BEST IN THE MARKET!

Special Constructions for different articles!

INDEPENDENT HEADS.

DOUBLE SYSTEM OF LOCKS.

Double-side Power Stands, 6 at once.

Paris, 1900, Gold Medal.

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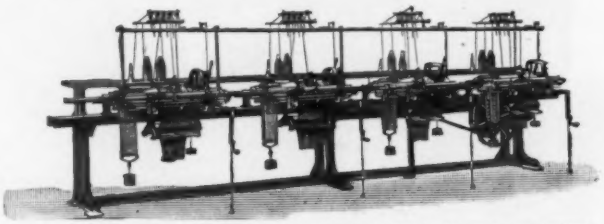

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GAS ENGINES for city or country
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} EFFICIENT, DURABLE, LOW IN PRICE

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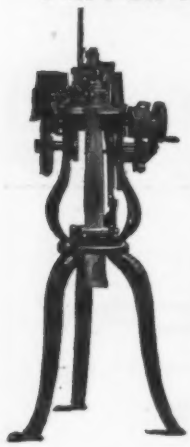
Manufacturers of



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Has no equal for simplicity and durability. It is the only Knitter on the market that gives manufacturers full value for their money, and leaves a swelled bank account. It is fully patented, no royalty to pay; built in sizes from 2½" up to 6"; from 42 up to 220 needles in 3¾" machine. Knits men's, ladies' and children's hose, plain or ribbed. Runs with one single belt. Automatic tension in heel and toe. Send for prices and particulars to

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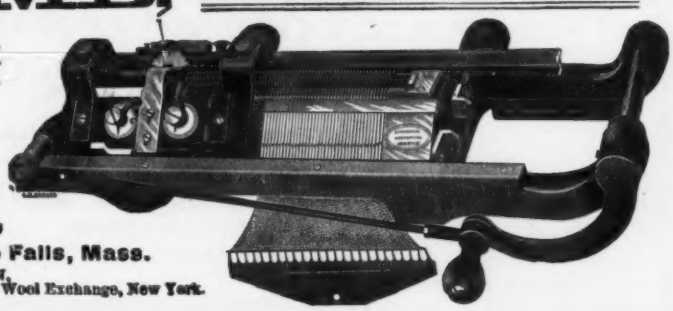

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(TRADE MARK)

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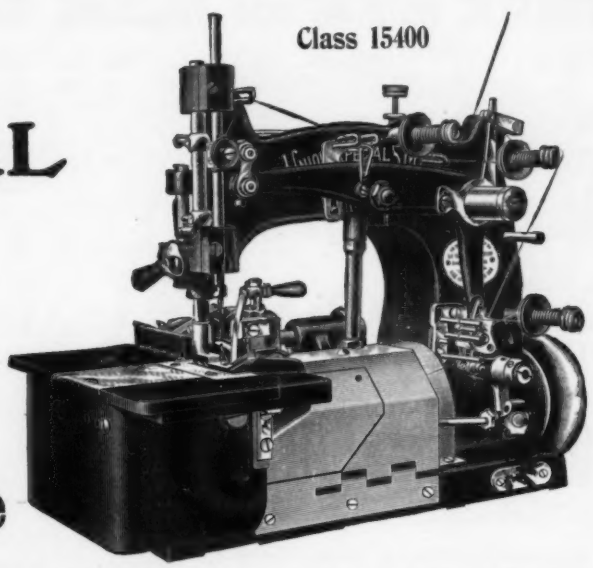
Class 15400



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By increasing production of operators, these machines reduce cost. Expenditure for Union Specials always means a profitable investment.

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FOR ALL KINDS AND GAUGES OF SEAMLESS HOSIERY.
RANGE ON HALF HOSE AND LADIES FROM 260 NEEDLES DOWN.

3-4 AUTOMATIC KNITTER

With Lace Effects.

Exclusive rights to BROWN'S LACE ATTACHMENT.

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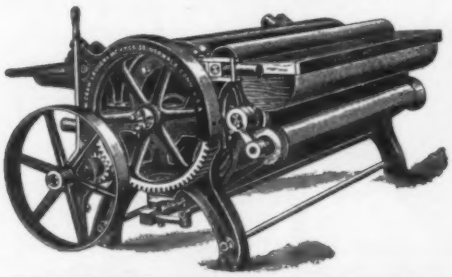

This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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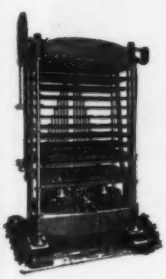

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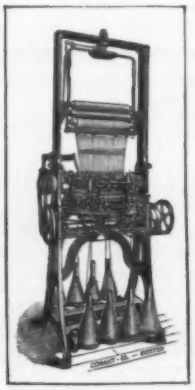

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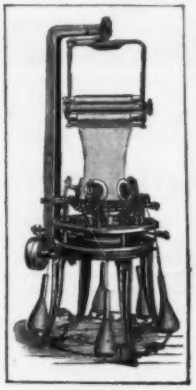
Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder.



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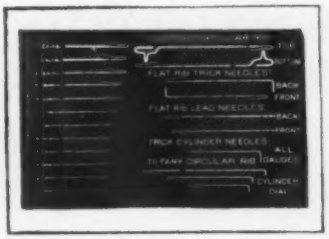
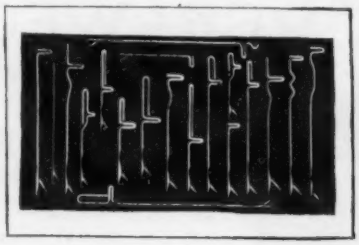
For making Cuffs, Drawer Bottoms and Shirt Borders.



Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.



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FULL AUTOMATIC MACHINE.

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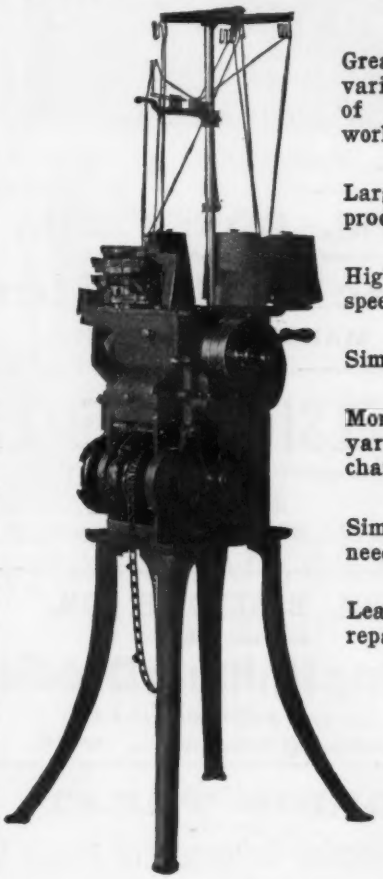

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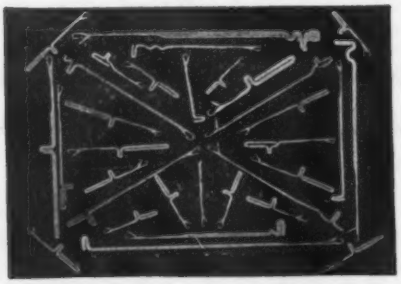

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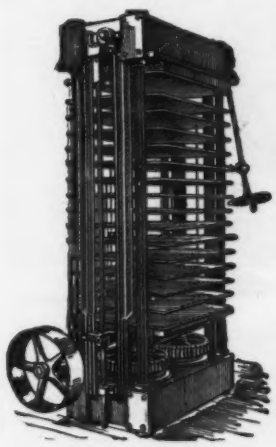

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MECHANICAL HEATING, VENTILATING AND DRYING, MECHANICAL DRAFT FANS

ELECTRIC Propeller Fan.

12 inches to 12 feet.

Alternating and Direct Current.

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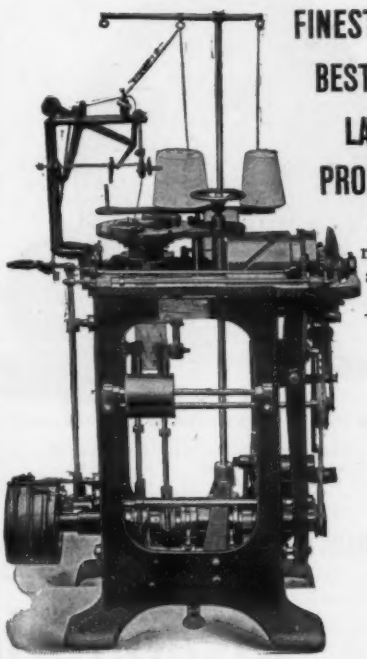

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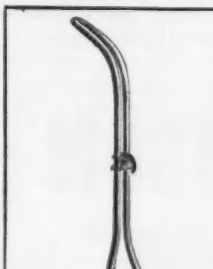

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Clark's Ash-Can Truck

a very handy and useful article around the furnace and cellar.

Frame of Truck is made of one piece of round steel, bent so as to form two hooks to hook into bottom of can, while an adjustable hook on handle grips top of can and keeps it from slipping.

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Boston Wool Exhausters, with Removable Tops.

AS USED IN CONNECTION WITH PNEUMATIC CONVEYOR SYSTEM FOR HANDLING WOOL, COTTON, RAGS, EXCELSIOR, JUTE, ETC.

Inlet Side of Right-hand Wool Exhauster. Pulley Side of Left-Hand Wool Exhauster.

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

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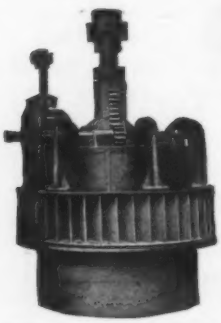

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RISDON CELEBRATED TURBINE
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On Horizontal or Vertical Shafts.

These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.

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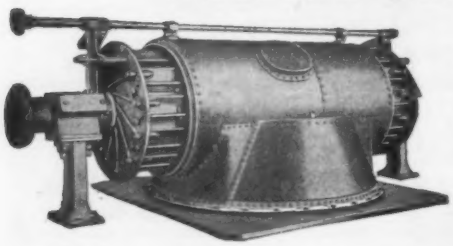

AN EVEN and REGULAR SPEED under all CHANGES of LOAD is always desirable. This condition combined with a QUICK SPEED and HIGH EFFICIENCY makes a combination hard to beat. The SAMSON maintains all these conditions under the most severe tests.

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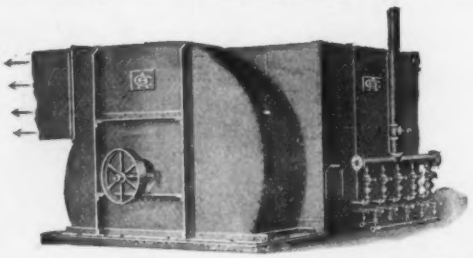
"A B C"
Heating and Ventilating System



The System

A bank of Steam Coils encased in sheet iron.
A Fan to force or draw air over the heated coils.
Brick or galvanized iron ducts to distribute the air.

The Results

A constantly changing supply of pure, fresh air at comfortable temperature.

The Cost

Expense for installation and operation reduced to minimum.

May we figure with you?

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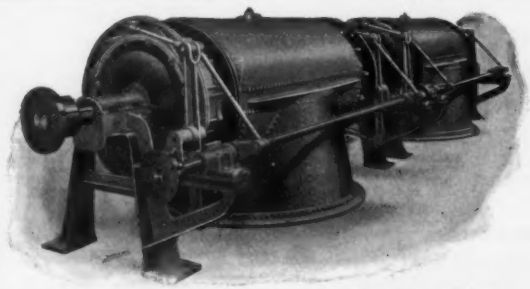

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The High Speed, Power, Efficiency and Durability of the

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ADAPT IT TO ALL CONDITIONS.

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4,000 H. P., 72 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N, Y.

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For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

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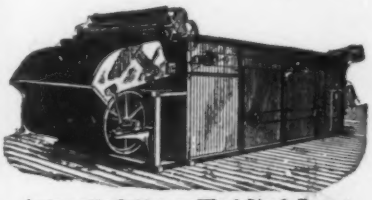
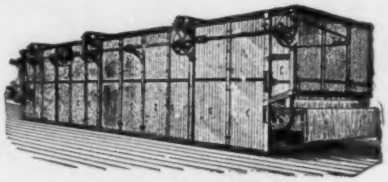
"CYCLONE" DRYERS

For Cotton Stock, Wool Stock, Rags, Yarn, Cloth, Underwear, Stockings, etc.



Automatic Cotton or Wool Stock Dryer.



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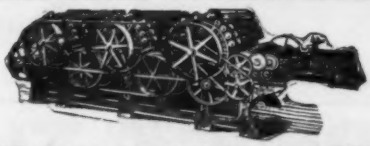
Steel Bladed Ventilating Fans.

Iron Bowl Yarn Scouring Machines.

Complete Carbonizing Outfits for Wool, Rags or Cloth.

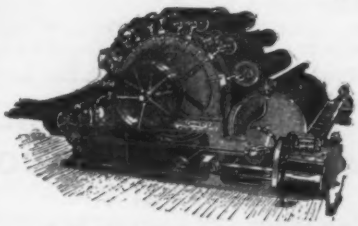
THE PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Streets, PHILADELPHIA, PA., U. S. A.

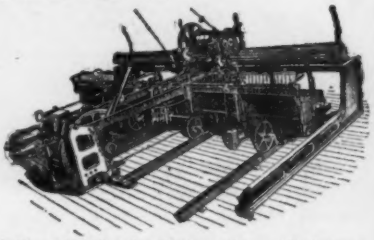


CARNETT MACHINES AND PICKERS

For reducing to Fibre Cotton and Wool Waste, Cloth Clippings, Etc.



WOOLEN MILL MACHINERY



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Complete Equipment for Manufacturing Cotton Batting for All Purposes.

Special Carding and Spinning Machinery for manufacturing Yarn from such low grade stock as Mill Sweepings, Linters, Etc.

We reclothe or furnish new Metallic Toothed Cylinders and Rolls and relagg or furnish new Cylinders for any make of Rag Picker.

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To Textile Manufacturers

BEGIN AT THE RIGHT END.

By bringing your trade-marked fabric before the readers of **The Delineator, The Designer** and the **New Idea Woman's Magazine,** you reach the woman of the home, the actual buyer and consumer of your goods. She is the one, and the only one, who moves your goods off the retail counter.

Who trademark their product, (part of it or all of it, and who—

—(Instead of letting their profits depend solely on current prices fixed by competition)
—(or solely on a selling agent's talent)

—devote part of their selling effort to create for their trademark a Consumer-Demand

—which makes it possible for the manufacturer to sell more goods, to sell at less expense, and with less uncertainty as to profits,—
—and which, increasing steadily from year to year, attaches to the trademark a
Permanent Good-Will

If you win her approval and patronage, all your channels of trade are open and complete. The **Retailer** will be glad to stock your goods,—will need to to do so in order to meet the demand. The **Wholesaler** will be glad to supply the **Retailer.**

If you work **only** at the **other end,**—only on **Wholesalers** and **Retailers,** your work is more difficult. The **consumer,** the woman of the home, knows nothing about your goods. You may manufacture the best fabric, retailing at the most reasonable price, but she has no knowledge of that. She does not "pull" them. If your goods are sold to her at all, it is only because they are **pushed** at her,—by **Retailers'** extra selling effort, or by his accepting a **smaller profit.**

Better start the other way. Make sure of the **outlet,**—the **consumption** of the product that bears your mark, and then all channels of trade are interested, and your salesmanship problem is solved.

Think about it, talk it over with me.

W. H. Black

ADVERTISING MANAGER

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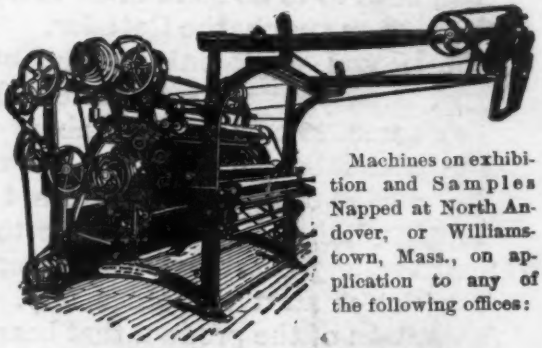

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